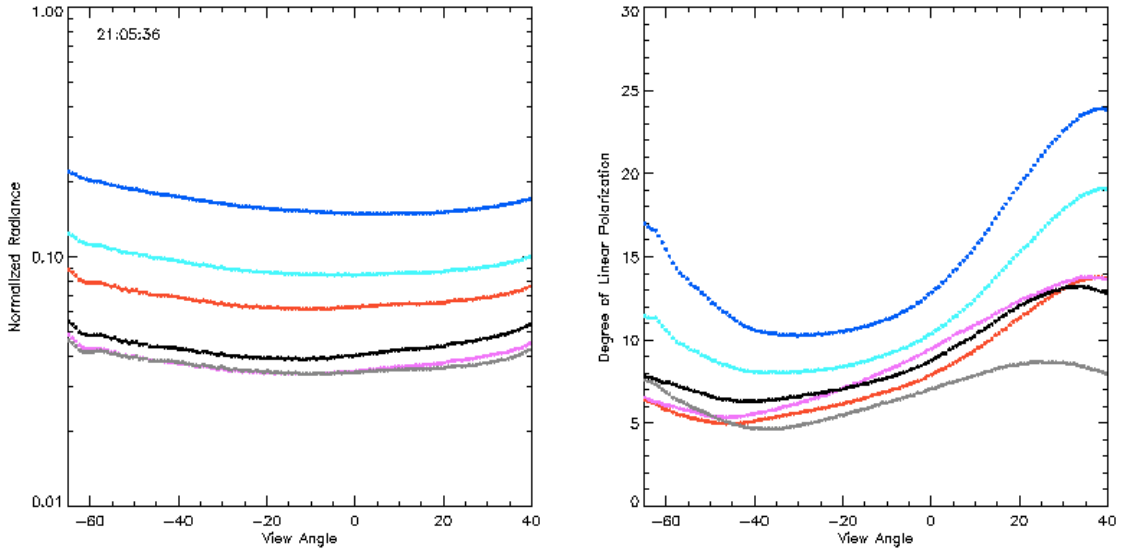
RSP Quick Look Data

In the following figures the flight tracks of the Proteus aircraft are shown with the location at which an RSP file (###) started overlaid on the flight track. These figures of the flight tracks are followed by plots of the nadir radiance and polarized radiance observed by the RSP at 410, 470, 555, 670, 865, 960, 1590, 1880 and 2250 (blue, mauve, turquoise, green, red, orange, fuschia, grey and black respectively) from the given files. The normalized radiance is shown in the top panel and the normalized polarized radiance is shown in the middle panel. The image at the bottom of each RSP data file figure is constructed from overlapping strip images which are sequentially cross correlated with one another. This is used as a check on aircraft attitude and v/h among inhomogeneous clouds. The real and imaginary values of refractive index for water and ice for the SWIR bands are:

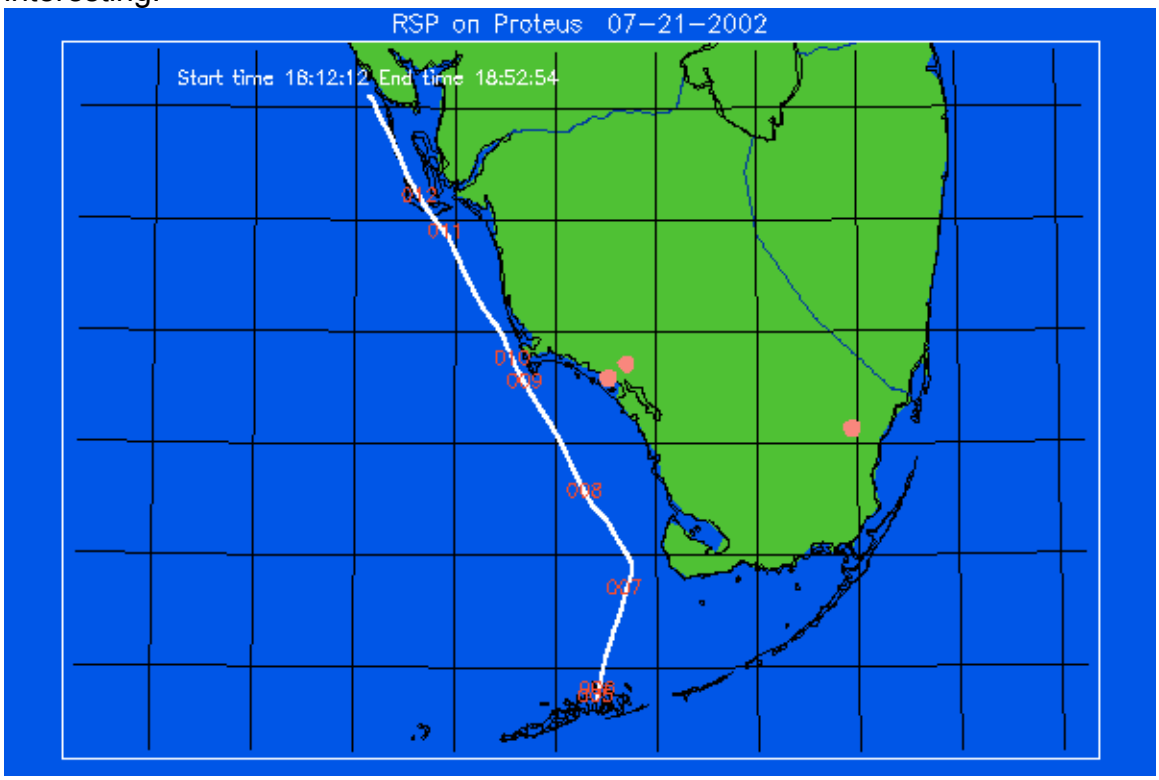
	NRIce	NIIce	NRWat	NIWat
1.58886	1.2895	0.000318	1.3182	0.000104
1.88447	1.2788	0.000317	1.3101	0.000880
2.26438	1.2562	0.000254	1.2875	0.000419

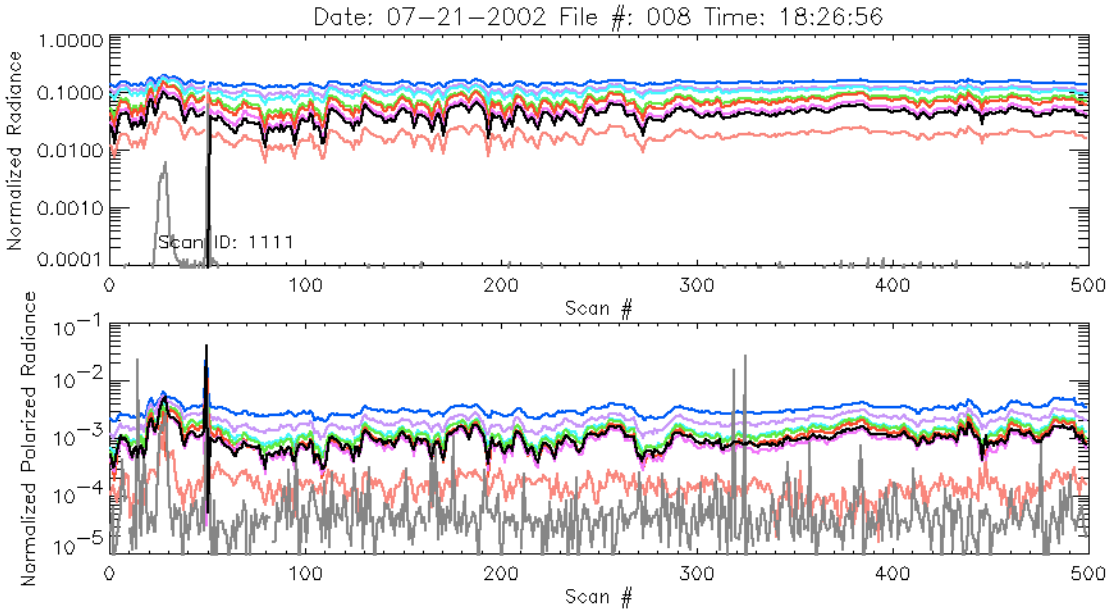
This means that typically for ice clouds the 1590 reflectance is lower than the 2250 nm reflectance. The RSP instrument scans along track and so for each nadir pixel shown in these figures there are also measurements over a view angle range of +50° to -70° (positive is in the direction of aircraft motion) every 0.8°.

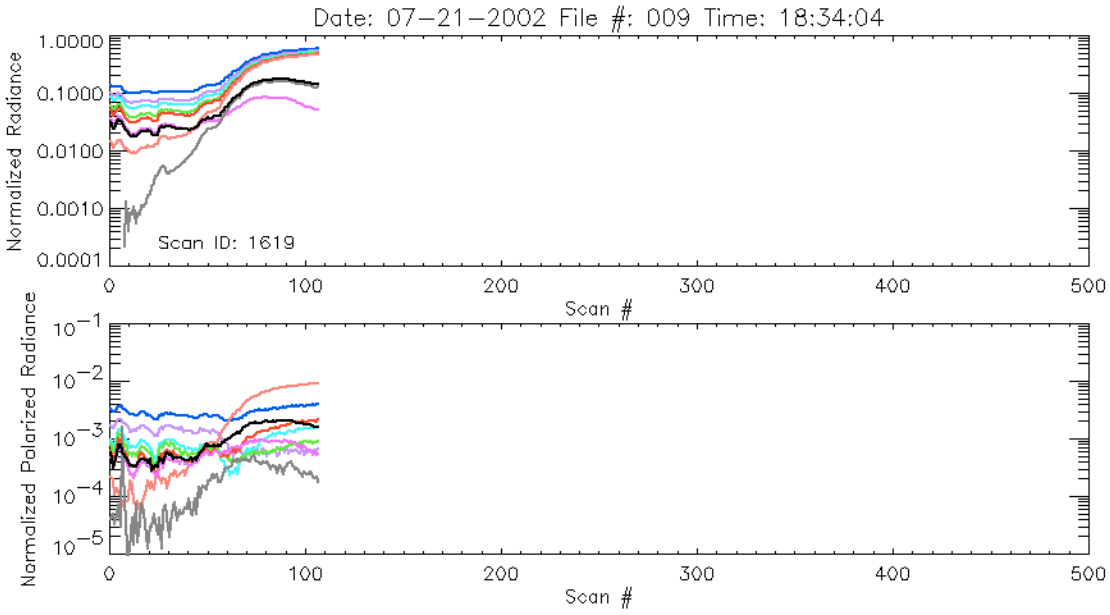


At 21:05 the WB57 flew underneath Proteus with thin cirrus present. The scattering signature seen here (solar zenith 48.9°, azimuth 275.8° and bearing 214.3°) is more indicative of aerosol than ice crystals. The brightness of the 1880 nm band suggests that the particles are in the upper troposphere and the relative brightness of the 1590 and 2250 nm bands suggests that the particles

are at least partly made of ice. Analysis of the WB57 data for this period will be interesting.



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0.0100
0.0010
0.0001
Scan ID: 1619
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
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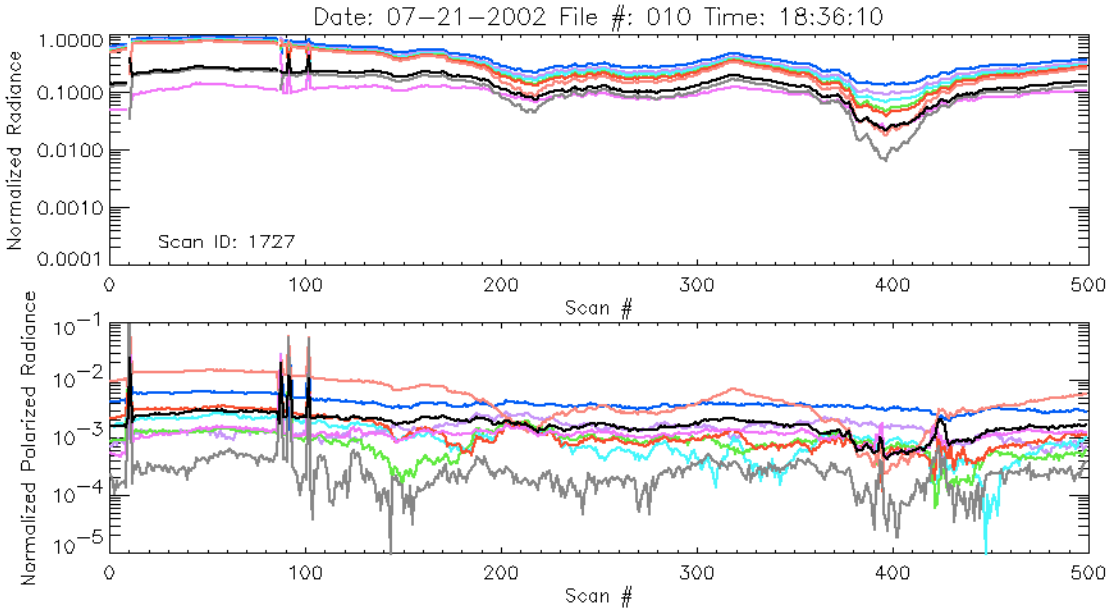
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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0.0100
0.0010
0.0001
Scan ID: 1727
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100
200
300
400
500
Scan #
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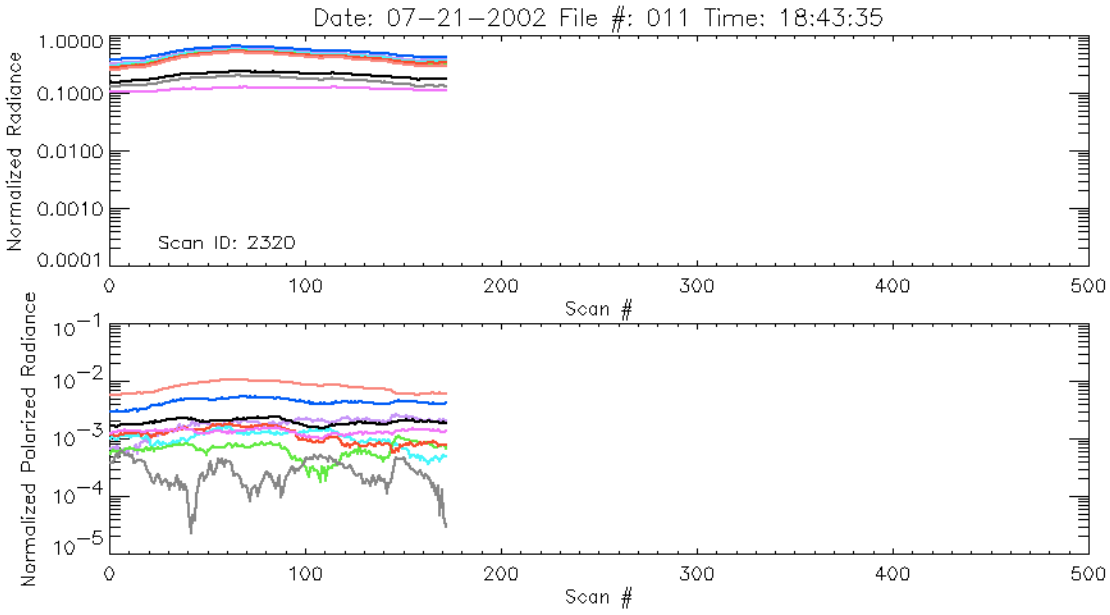
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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0.0100
0.0010
0.0001
Scan ID: 2320
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100
200
300
400
500
Scan #
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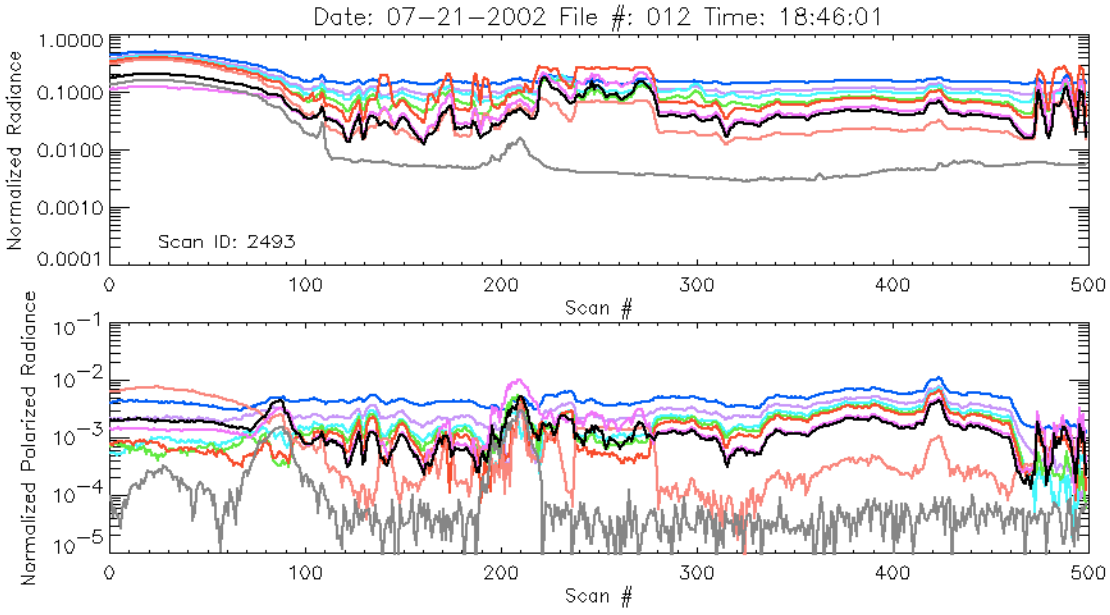
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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0.0100
0.0010
0.0001
Scan ID: 2493
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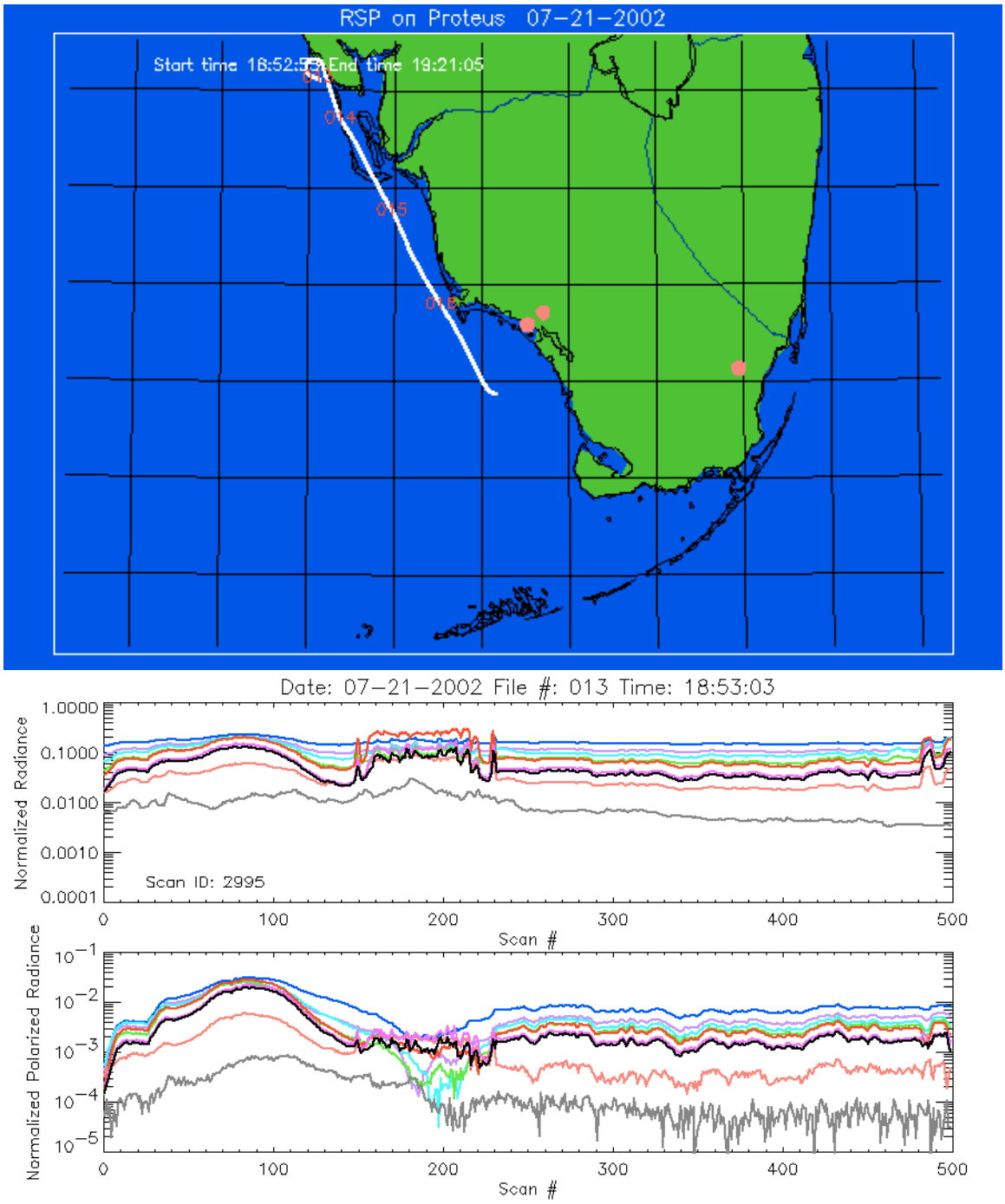
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


RSP on Proteus 07-21-2002
Start time 18:52:55
End time 19:21:05
014
015
016
Date: 07-21-2002 File #: 013 Time: 18:53:03
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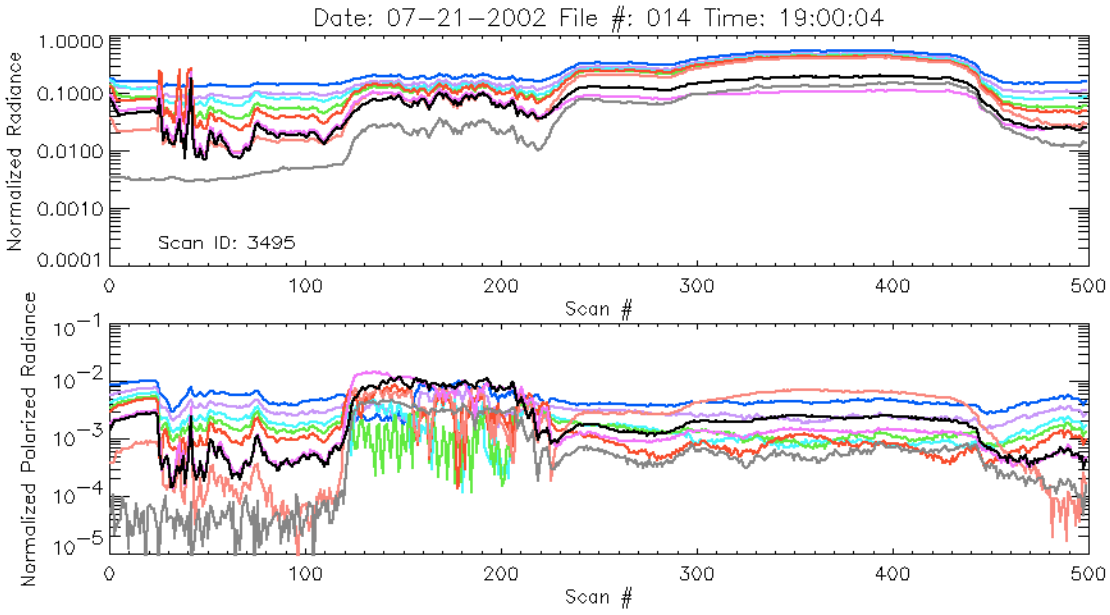
0.1000
0.0100
0.0010
0.0001
Scan ID: 2995
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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0.0100
0.0010
0.0001
Scan ID: 3495
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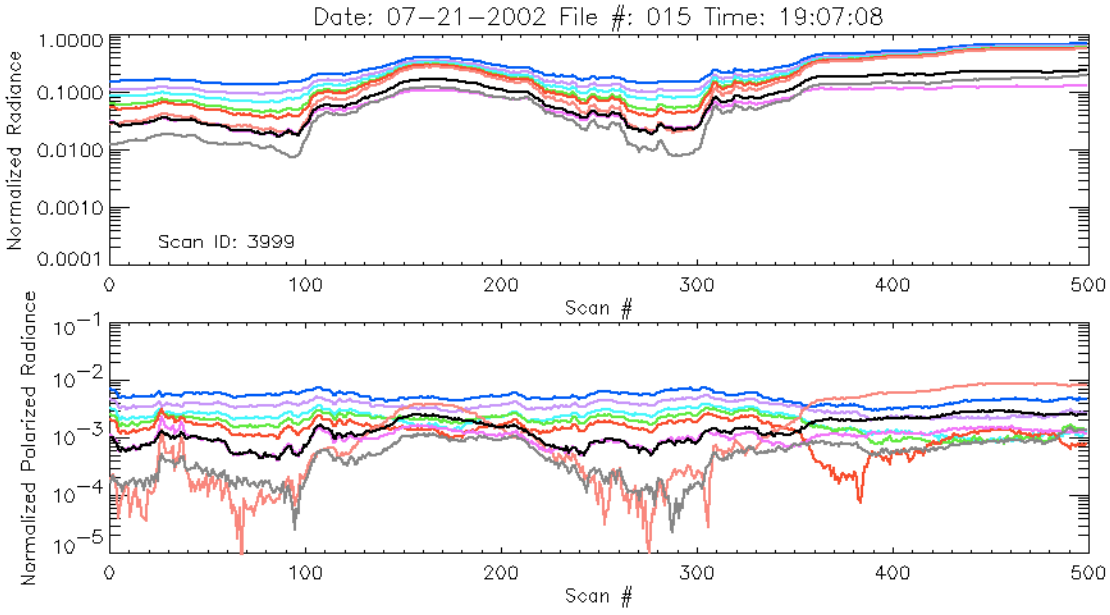
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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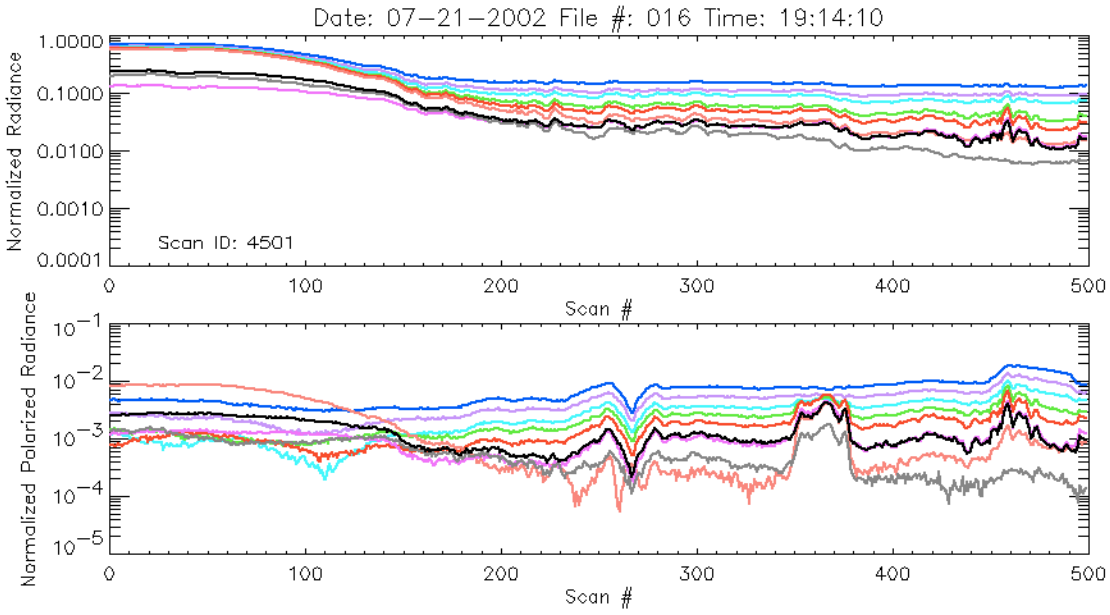
0.0100
0.0010
0.0001
Scan ID: 3999
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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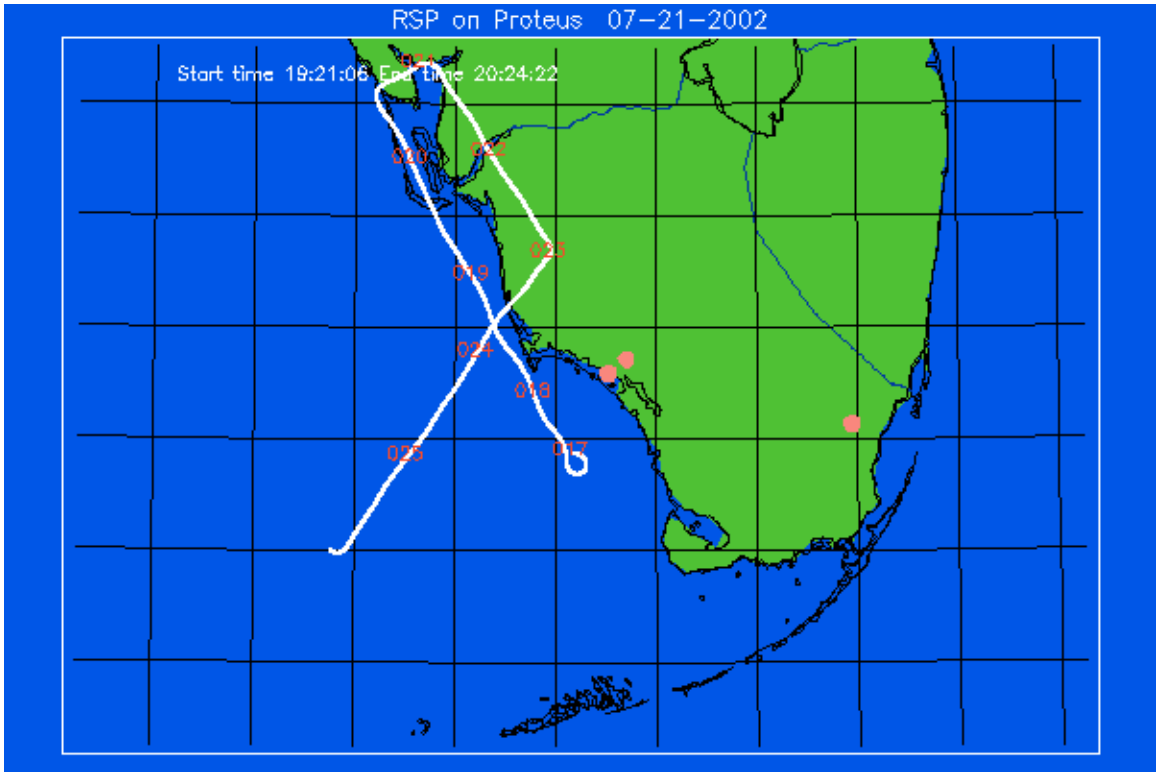
0.0100
0.0010
0.0001
Scan ID: 4501
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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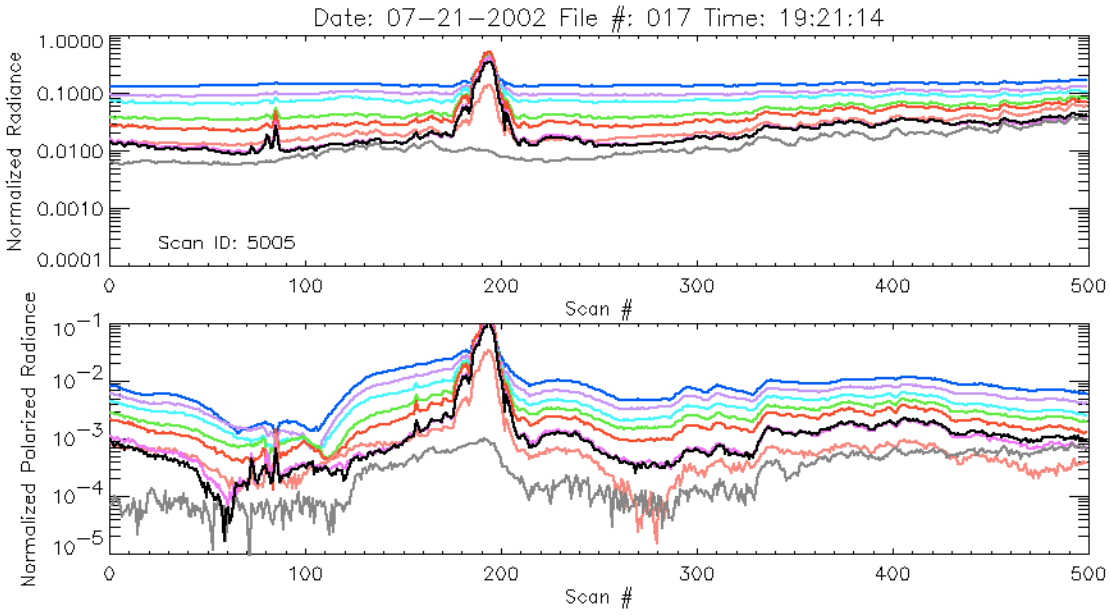
022
025
019
024
018
023
017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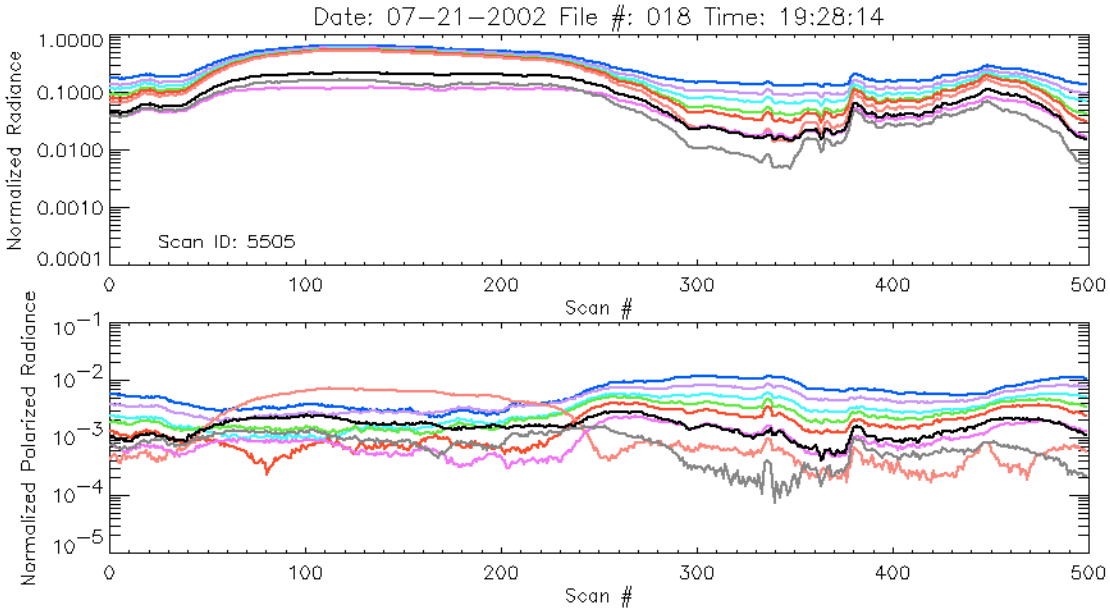
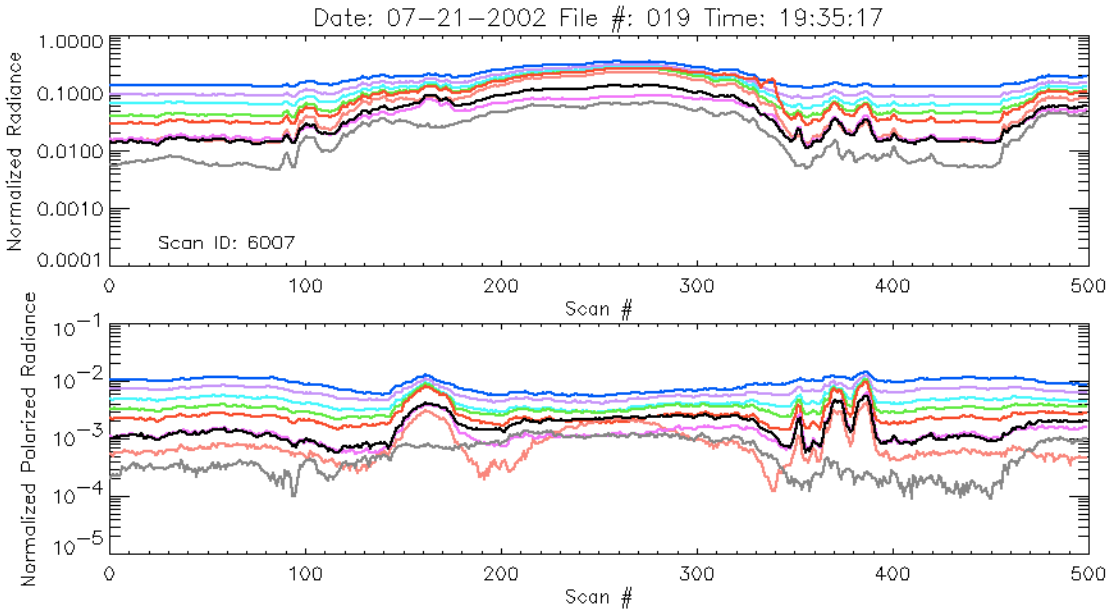
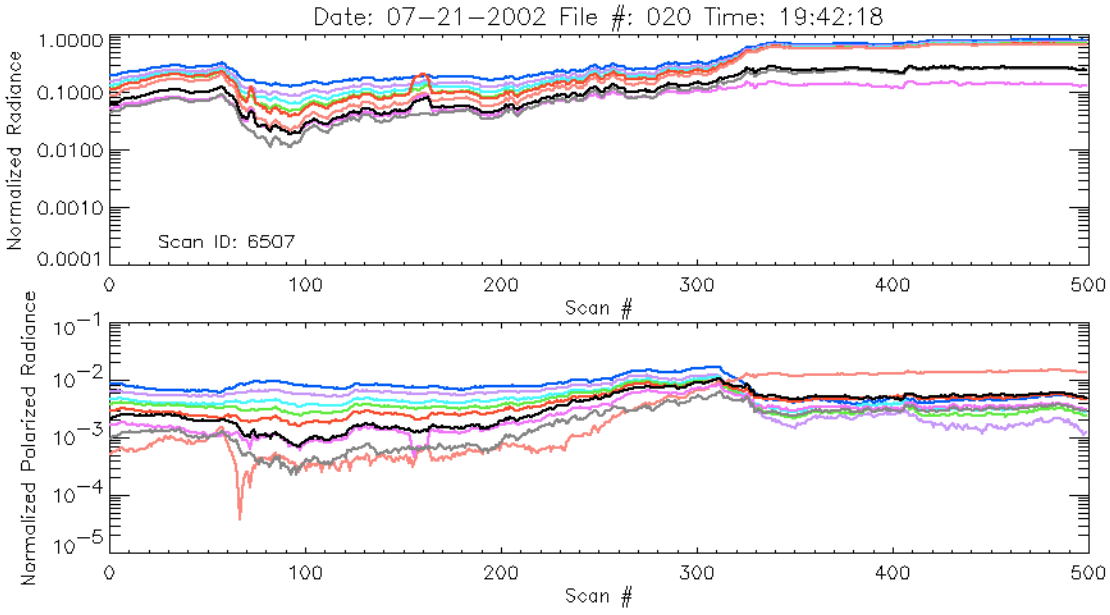
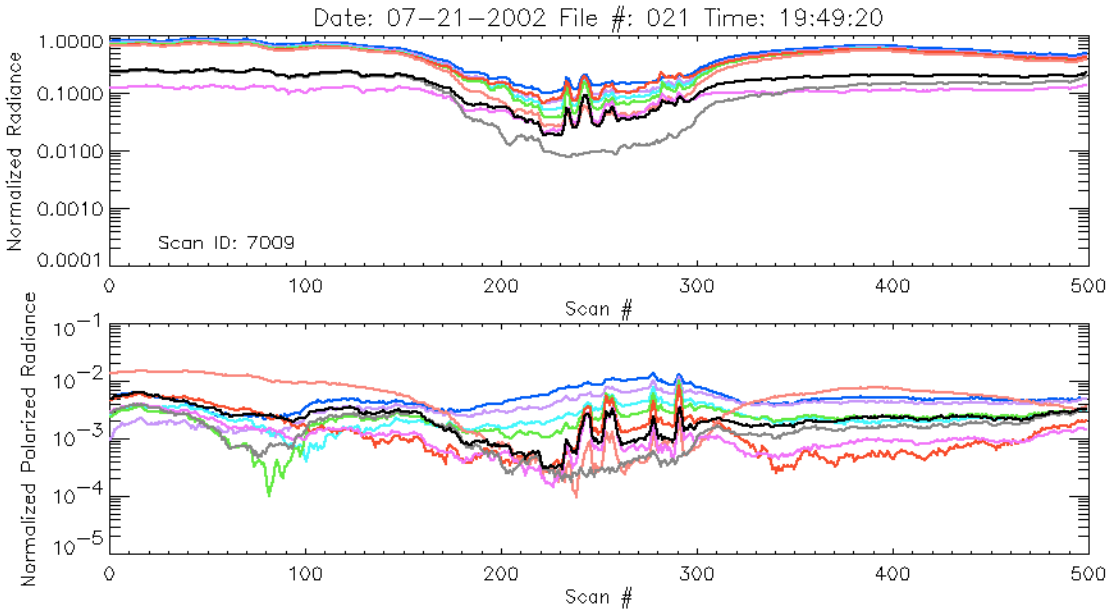
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 5005
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 018 Time: 19:28:14
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 5505
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 019 Time: 19:35:17
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 6007
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 020 Time: 19:42:18
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 6507
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 021 Time: 19:49:20
Normalized Radiance
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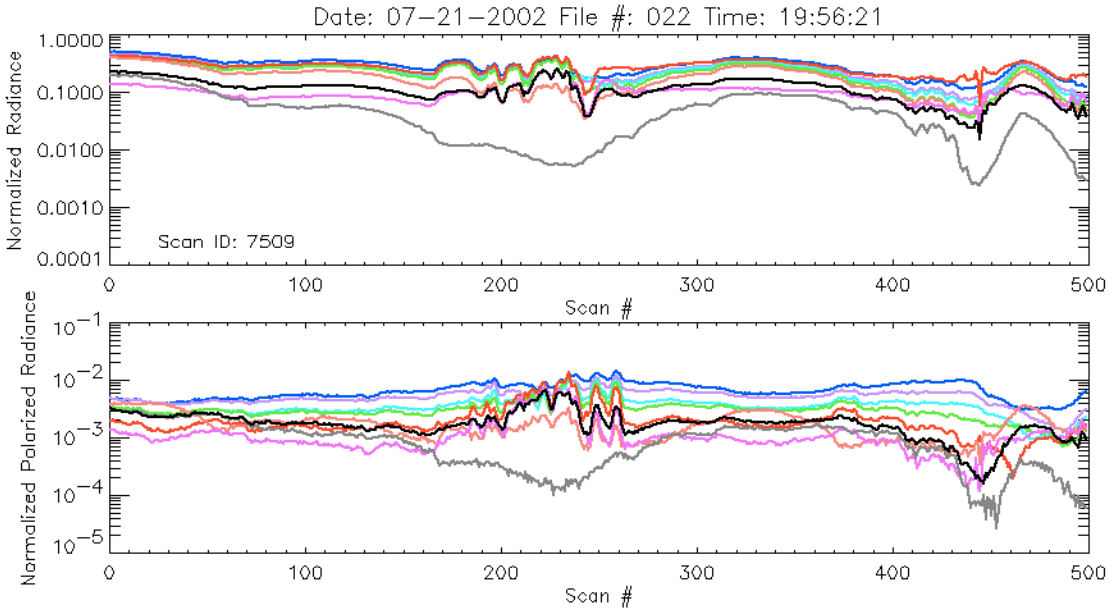
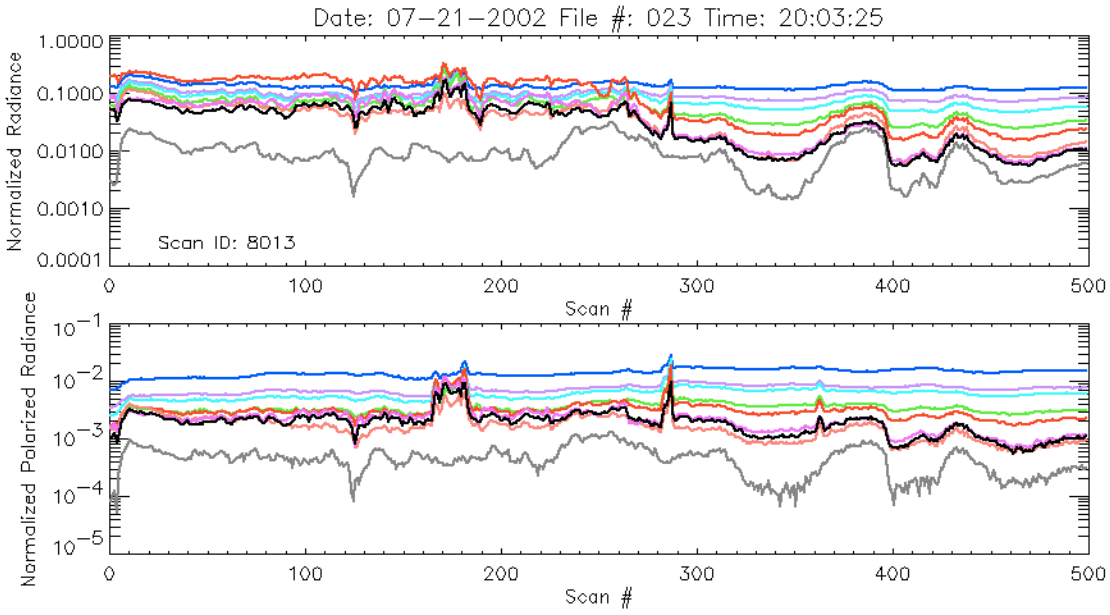
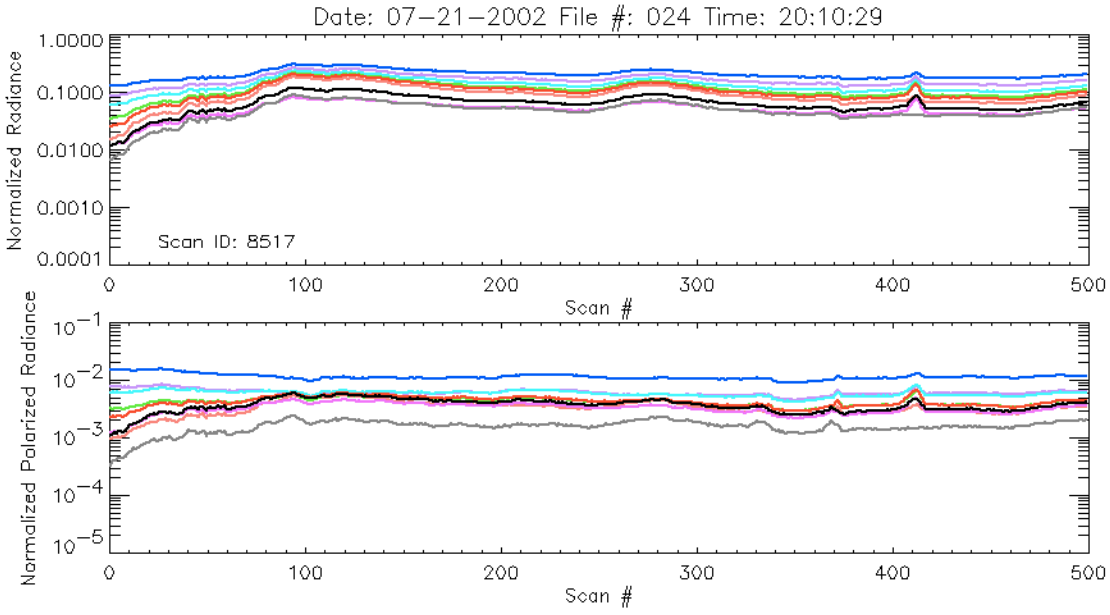
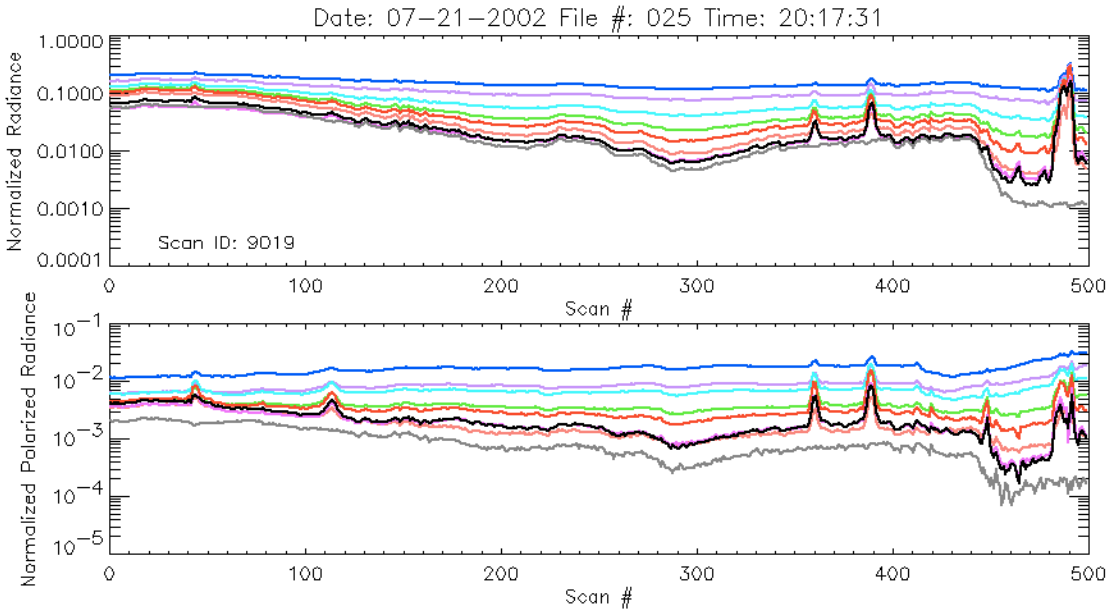
0.1000
0.0100
0.0010
0.0001
Scan ID: 7009
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 022 Time: 19:56:21
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 7509
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 023 Time: 20:03:25
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 8013
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 024 Time: 20:10:29
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 8517
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #


Date: 07-21-2002 File #: 025 Time: 20:17:31
Normalized Radiance
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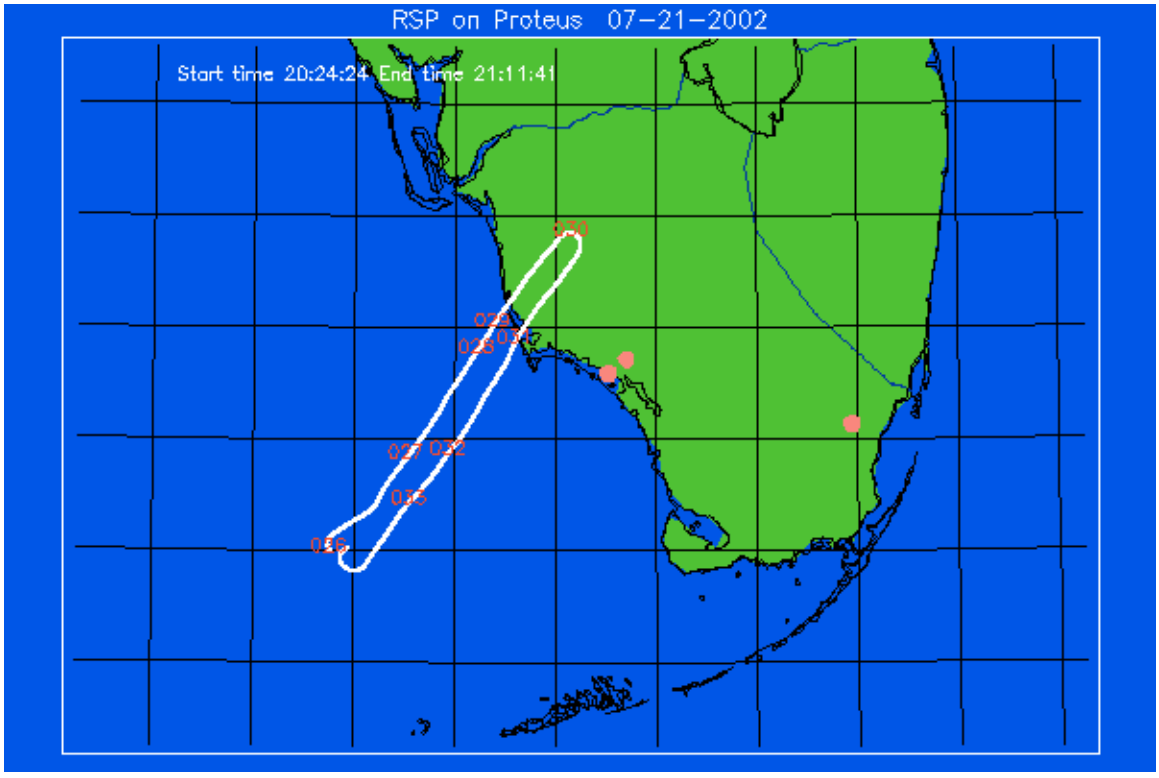
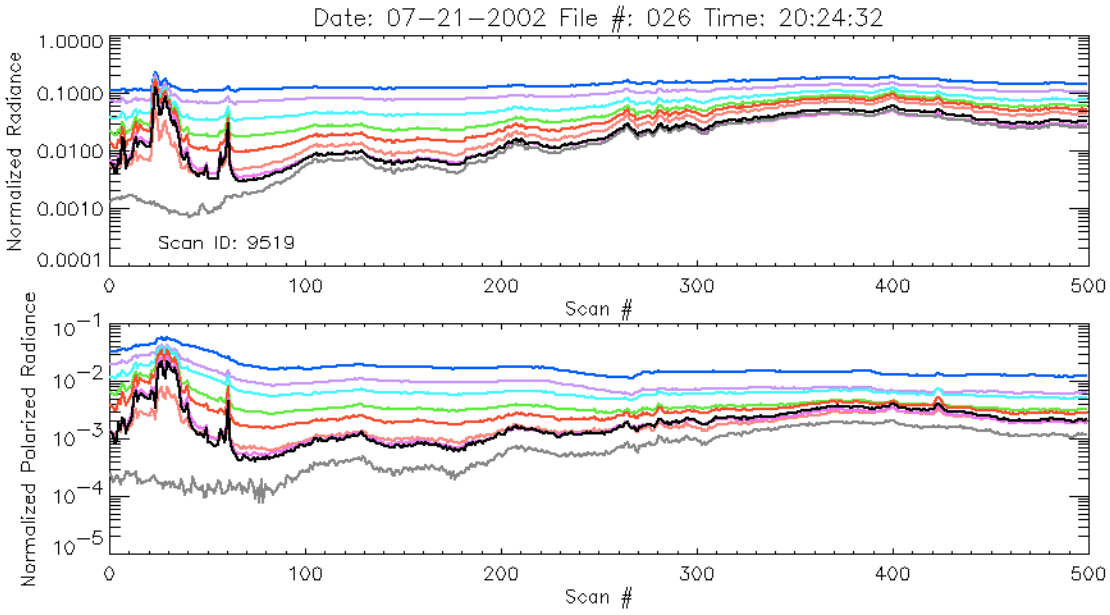
0.0100
0.0010
0.0001
Scan ID: 9019
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


RSP on Proteus 07-21-2002
Start time 20:24:24 End time 21:11:41
024
025
026
027
028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Normalized Radiance
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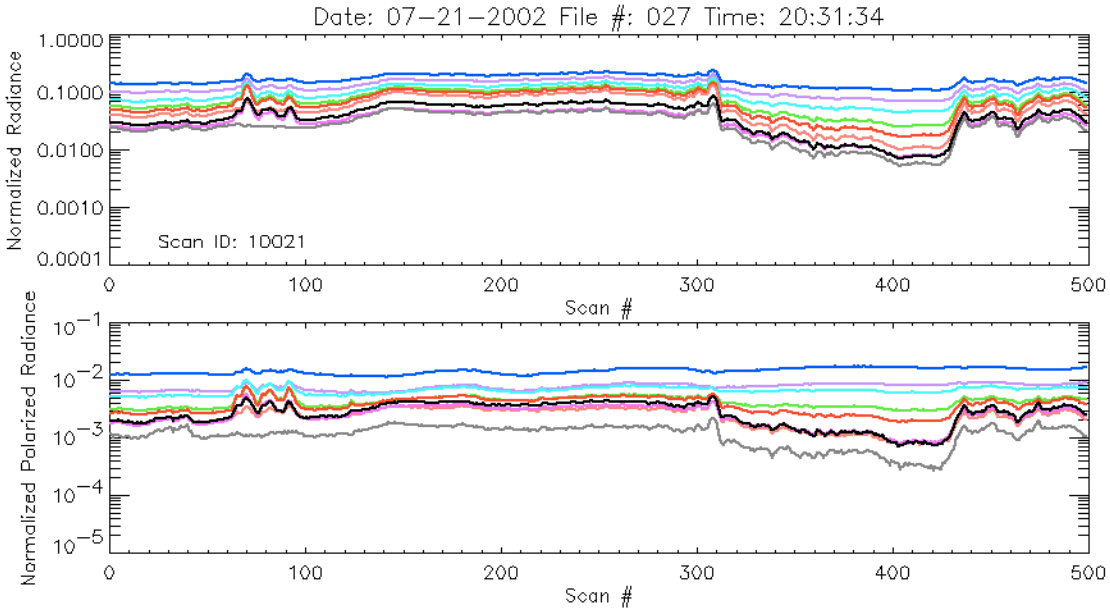
0.1000
0.0100
0.0010
0.0001
Scan ID: 9519
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #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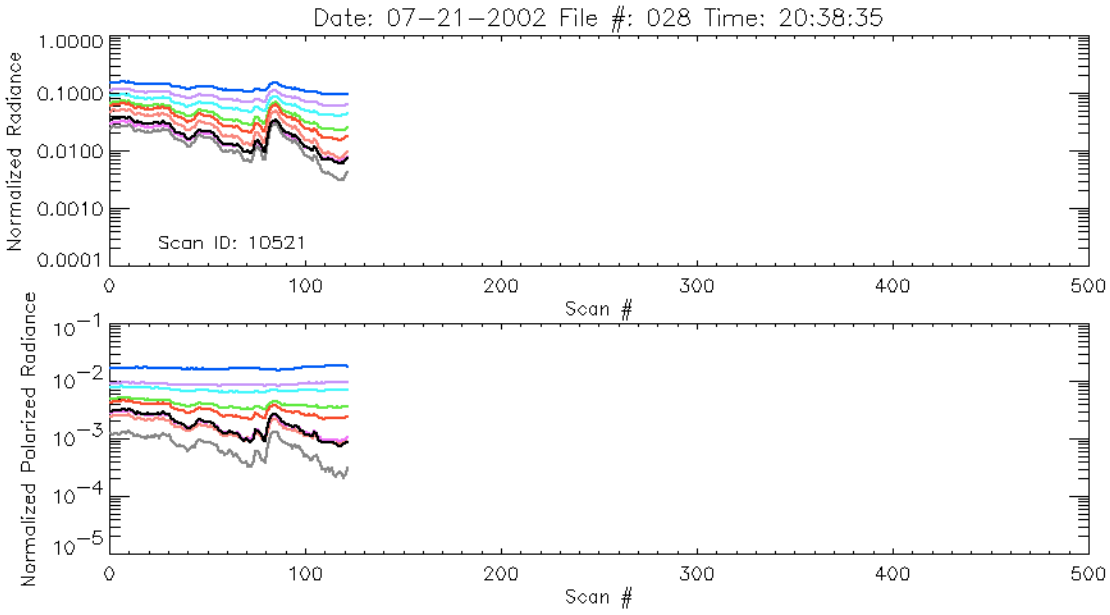
0.1000
0.0100
0.0010
0.0001
Scan ID: 10021
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #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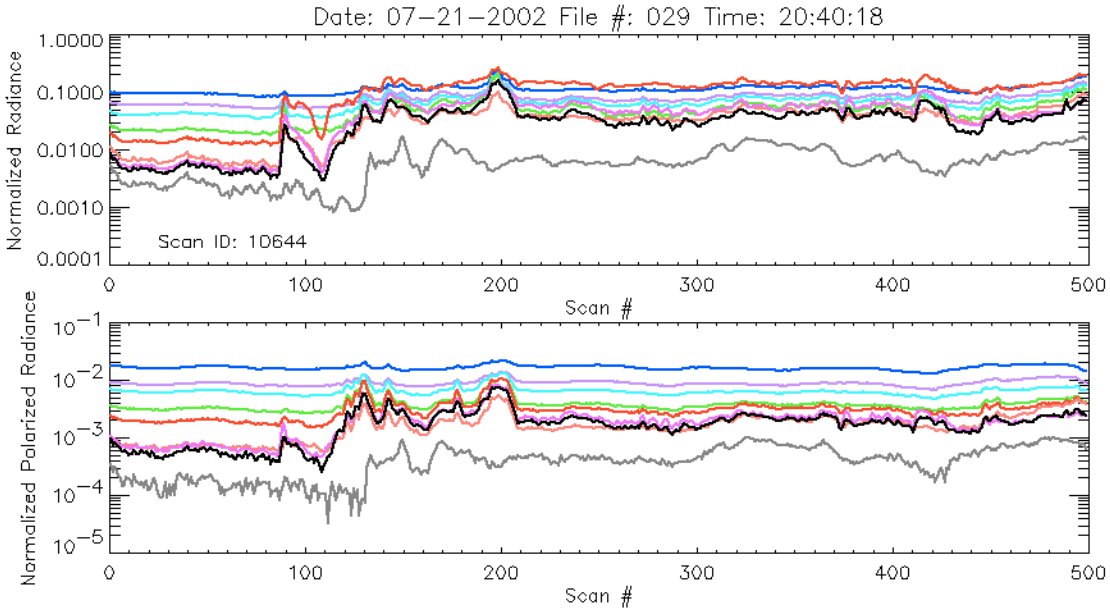
0.0100
0.0010
0.0001
Scan ID: 10521
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #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0.0100
0.0010
0.0001
Scan ID: 10644
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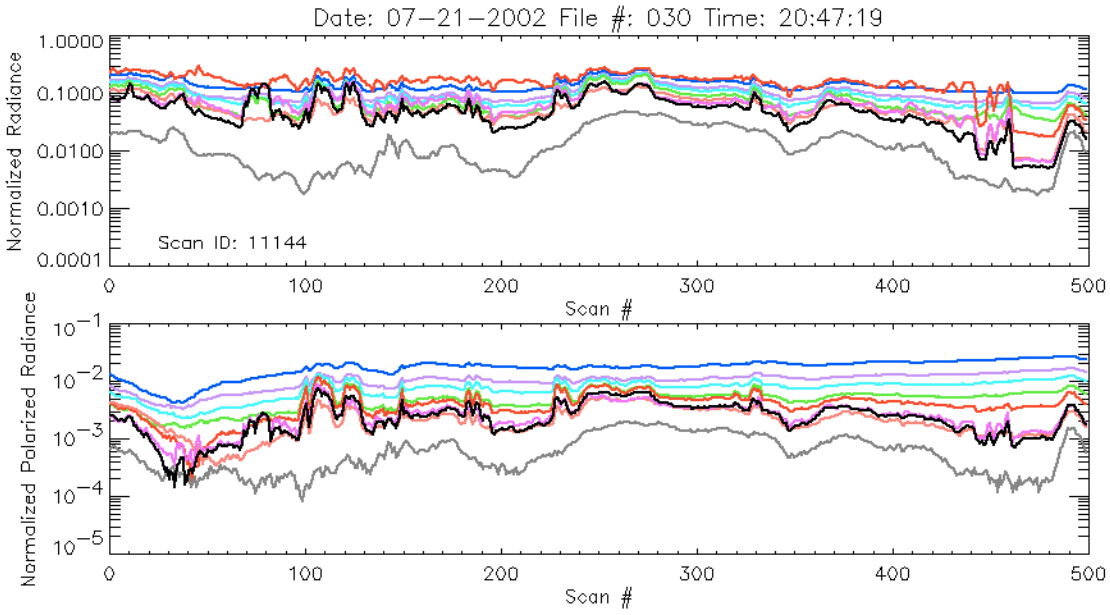
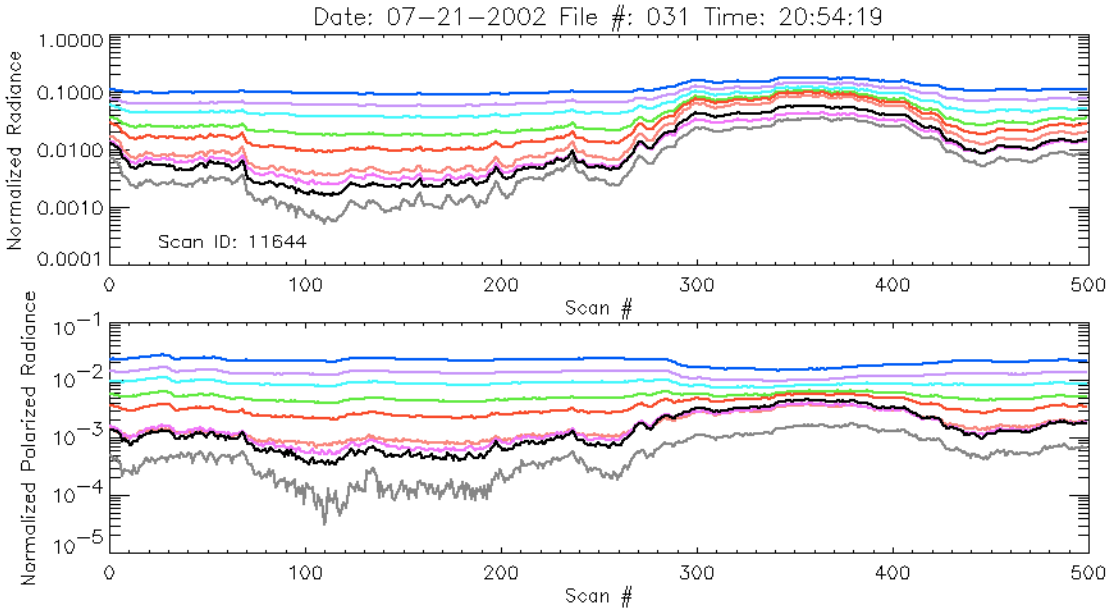
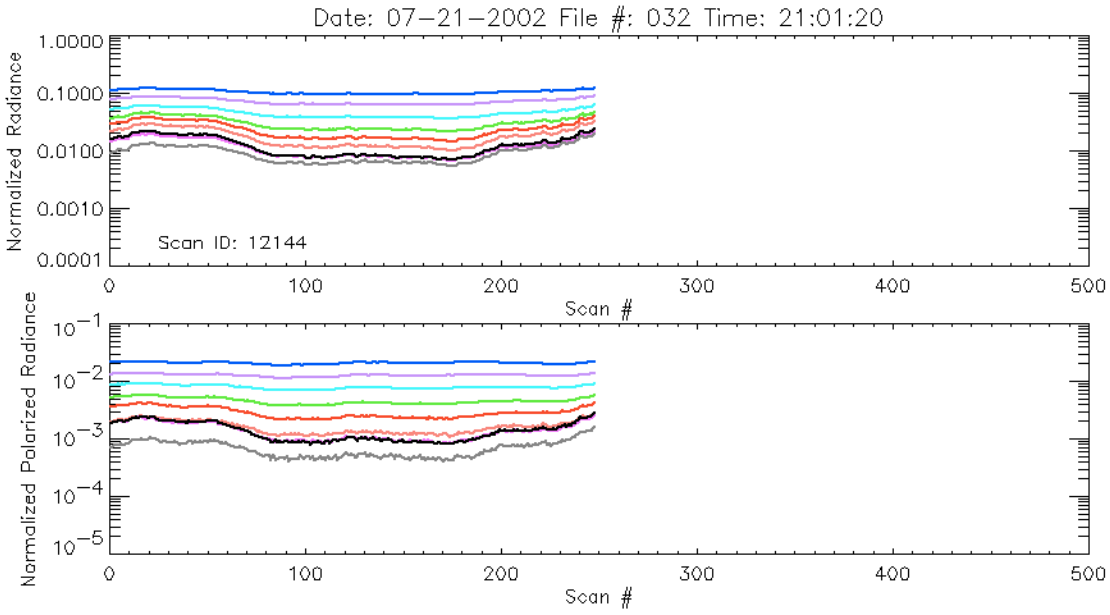
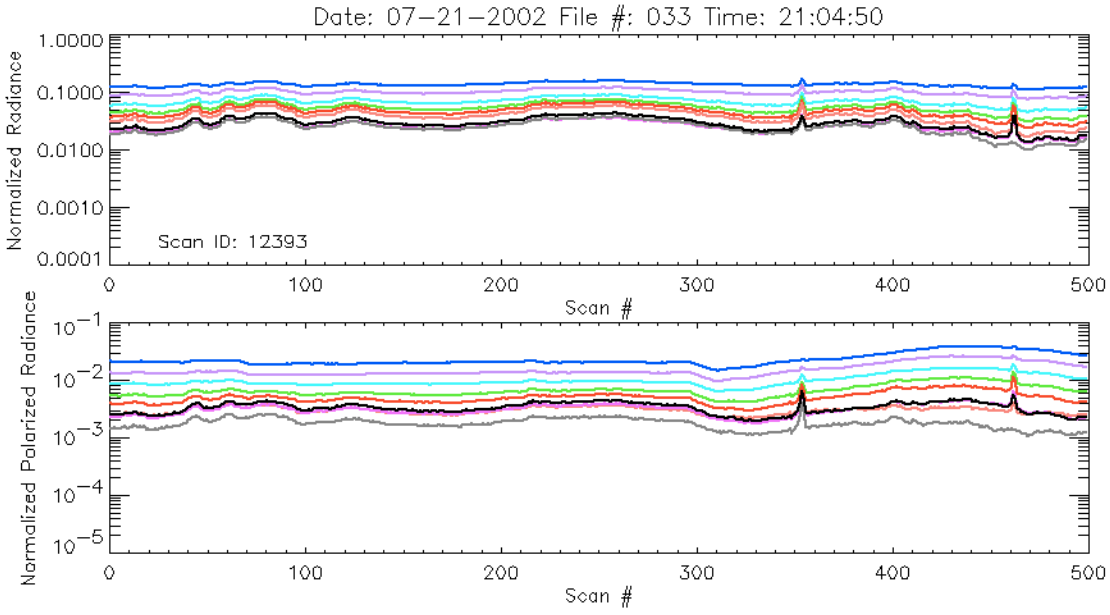
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 030 Time: 20:47:19
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 11144
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 031 Time: 20:54:19
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 11644
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 032 Time: 21:01:20
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 12144
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 033 Time: 21:04:50
Normalized Radiance
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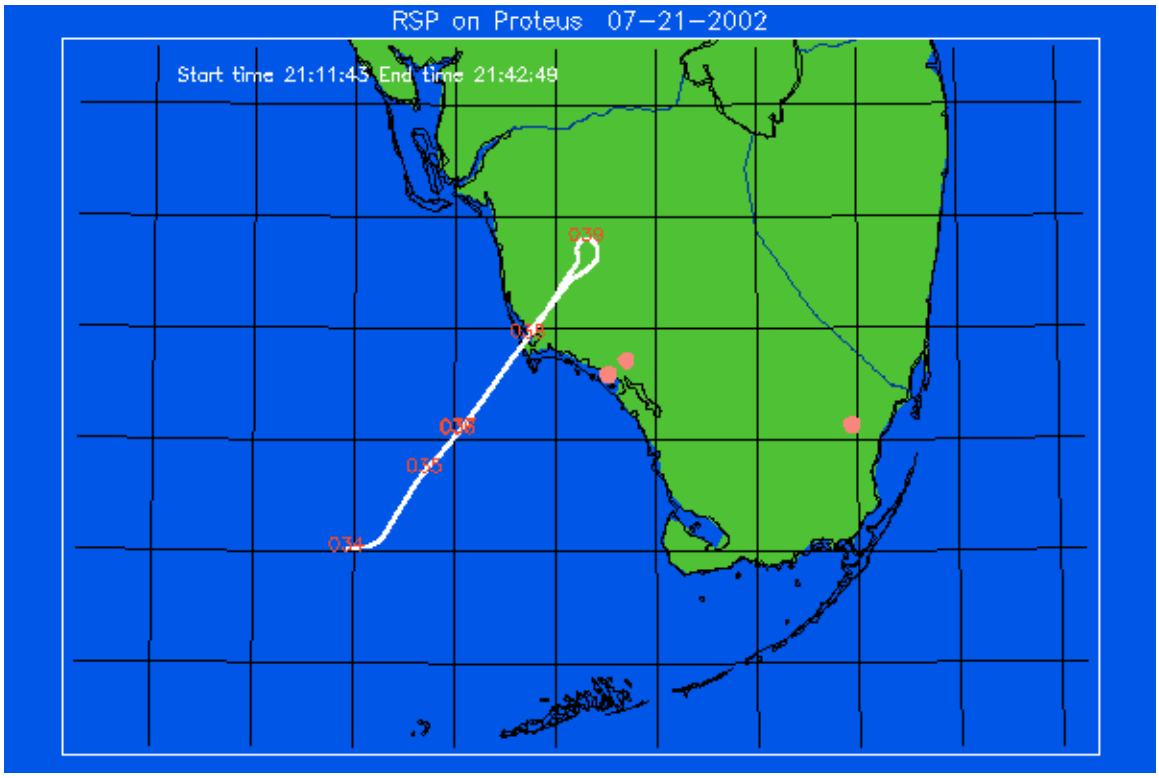
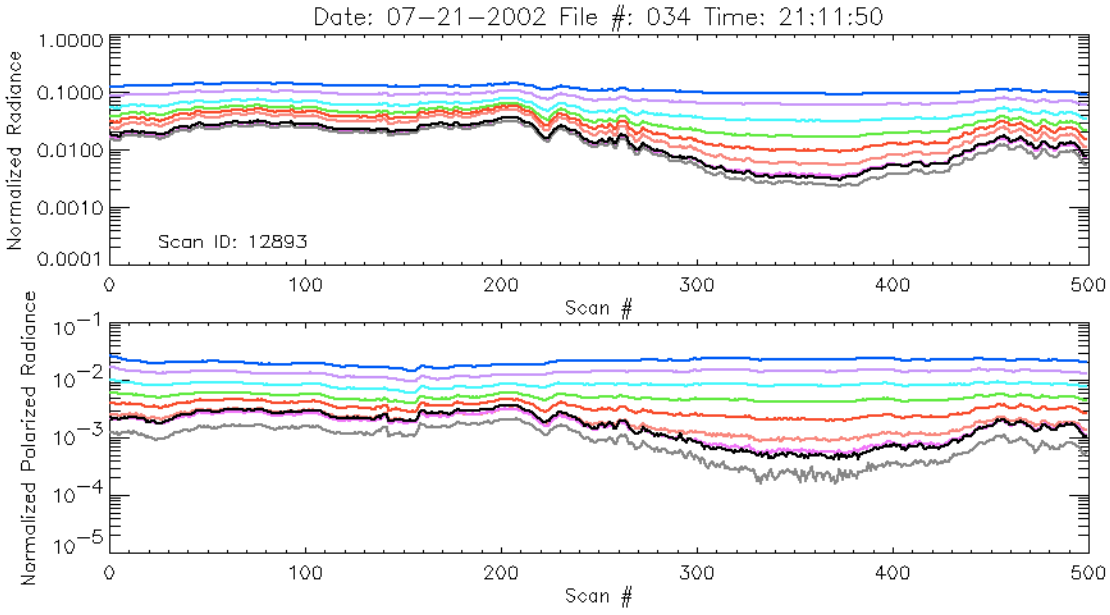
0.1000
0.0100
0.0010
0.0001
Scan ID: 12393
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


RSP on Proteus 07-21-2002
Start time 21:11:43 End time 21:42:49
039
038
036
035
034


Date: 07-21-2002 File #: 034 Time: 21:11:50
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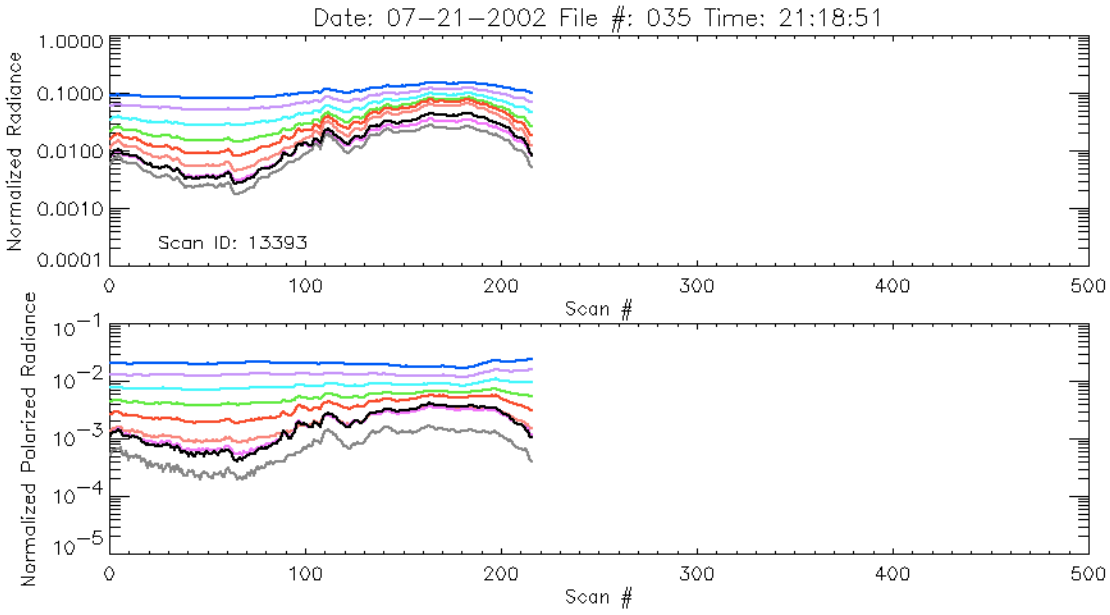
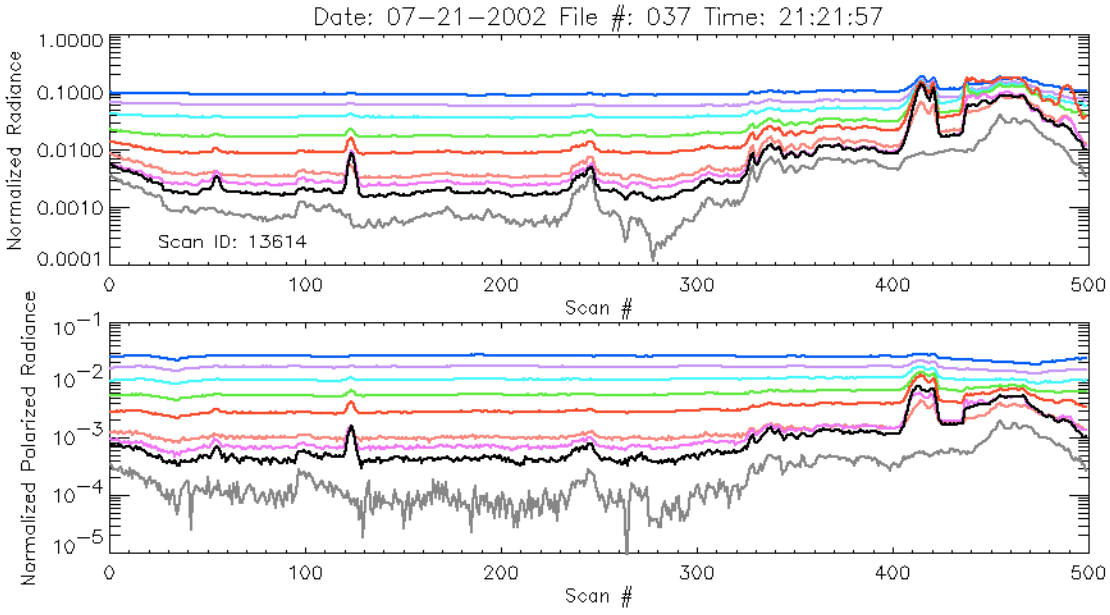
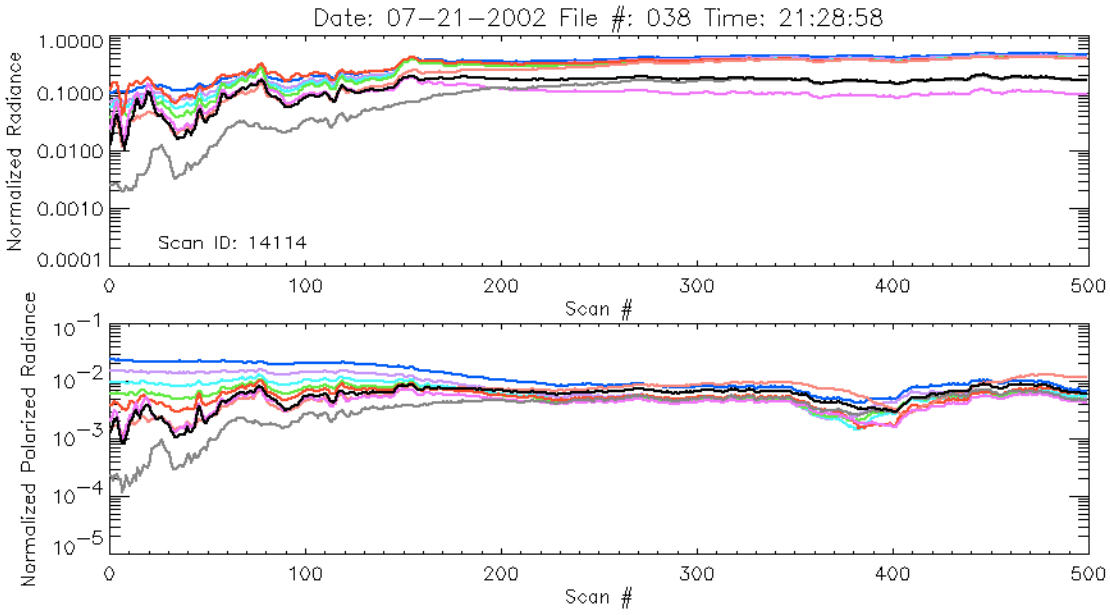
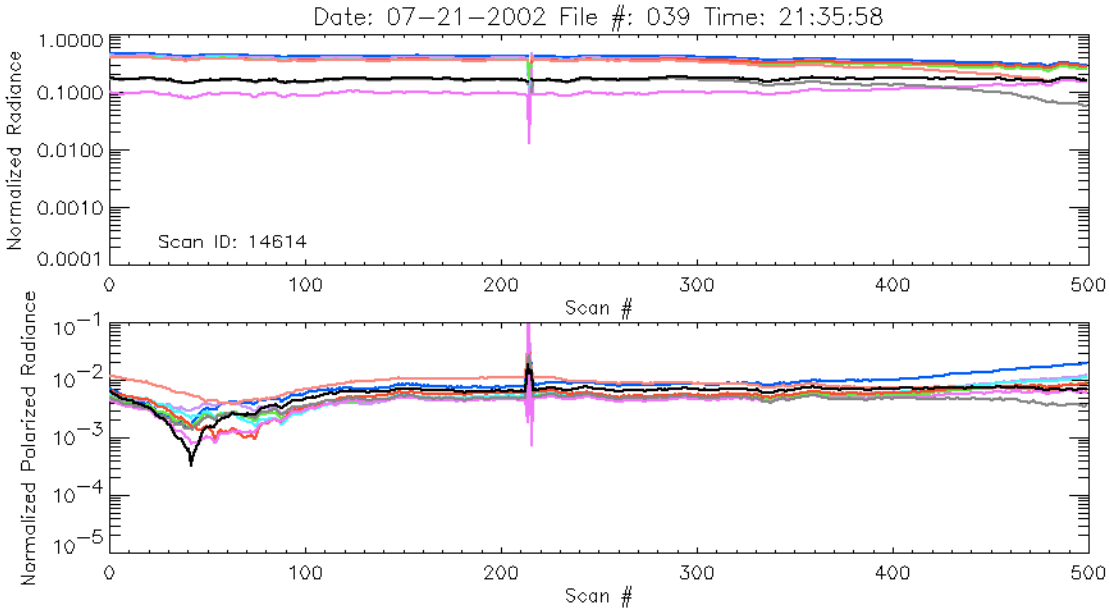
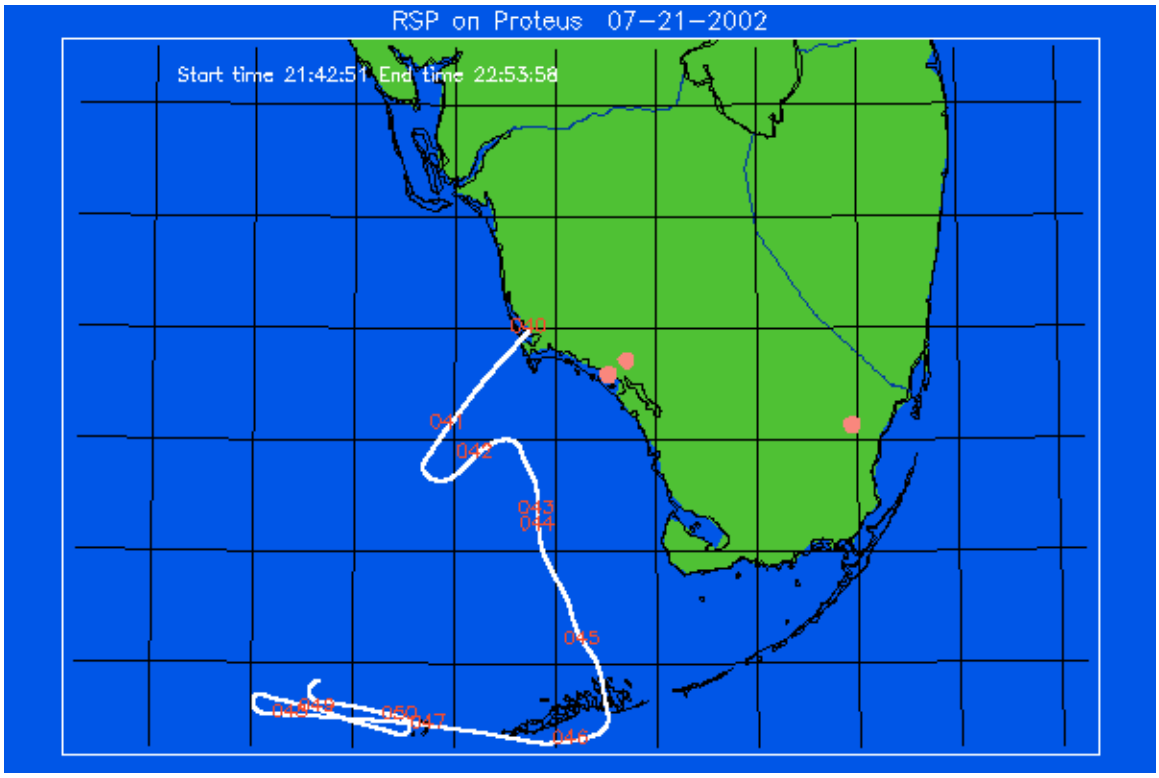
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 12893
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #

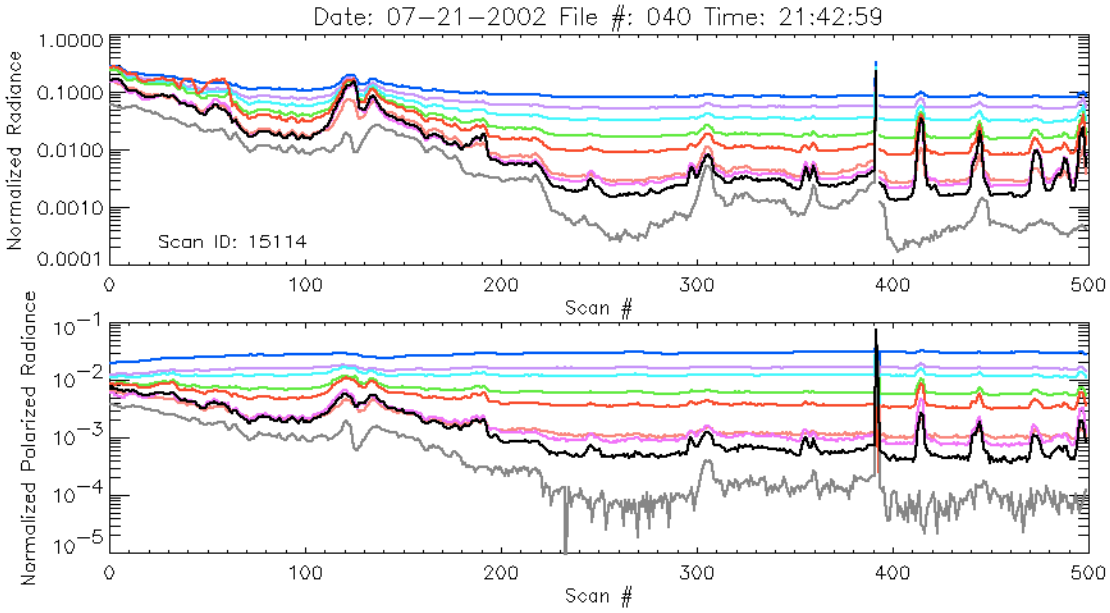

Date: 07-21-2002 File #: 035 Time: 21:18:51
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 13393
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

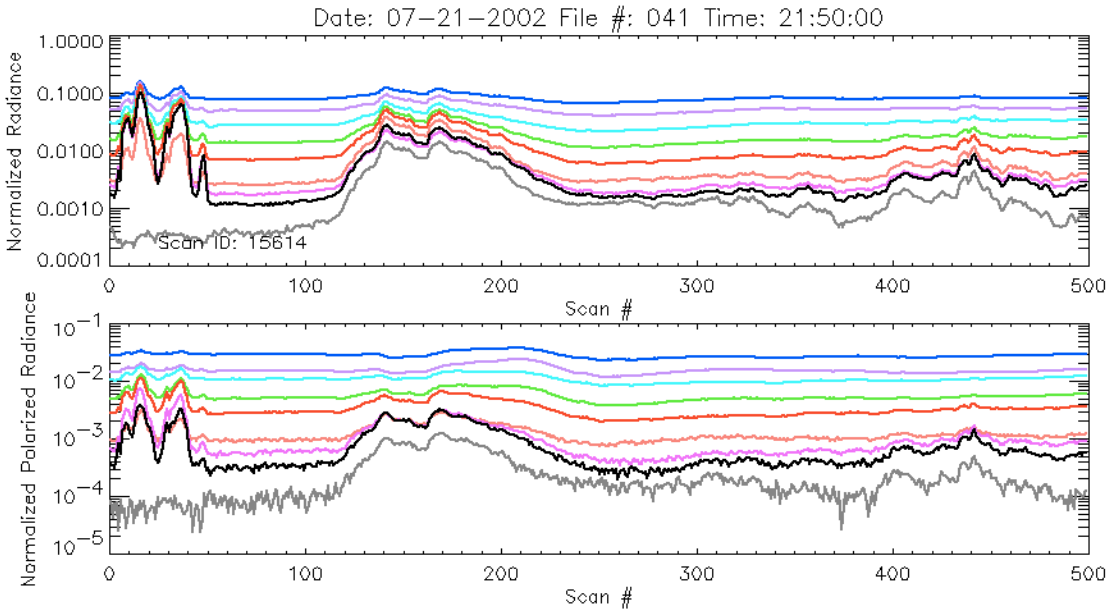

Date: 07-21-2002 File #: 037 Time: 21:21:57
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 13614
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

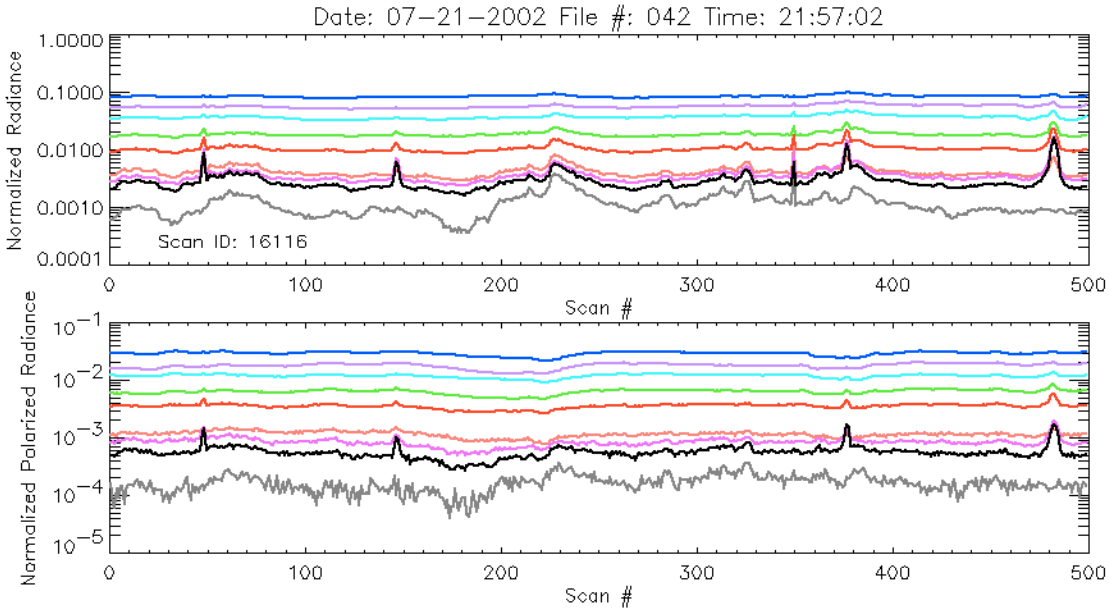

Date: 07-21-2002 File #: 038 Time: 21:28:58
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 14114
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

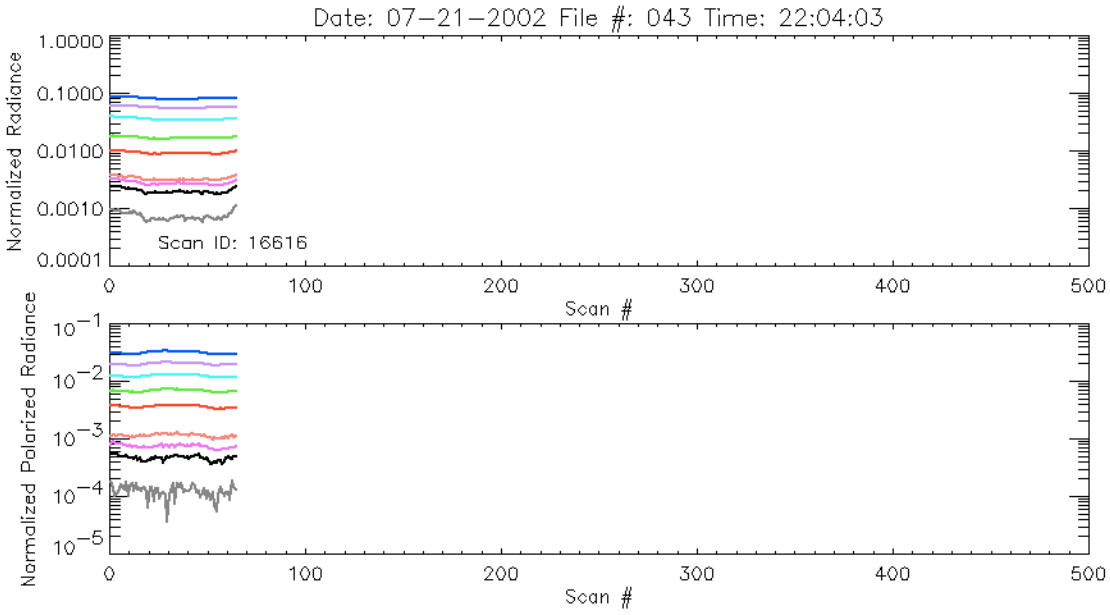

Date: 07-21-2002 File #: 039 Time: 21:35:58
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 14614
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

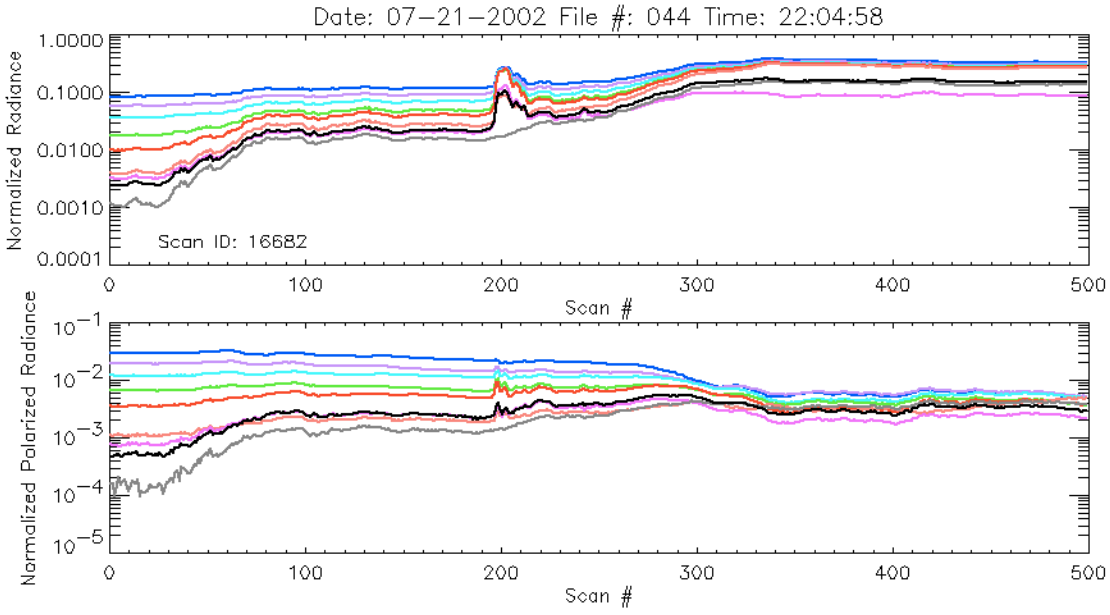

RSP on Proteus 07-21-2002
Start time 21:42:51 End time 22:53:58
040
041
042
043
044
045
046
047
048
049
050

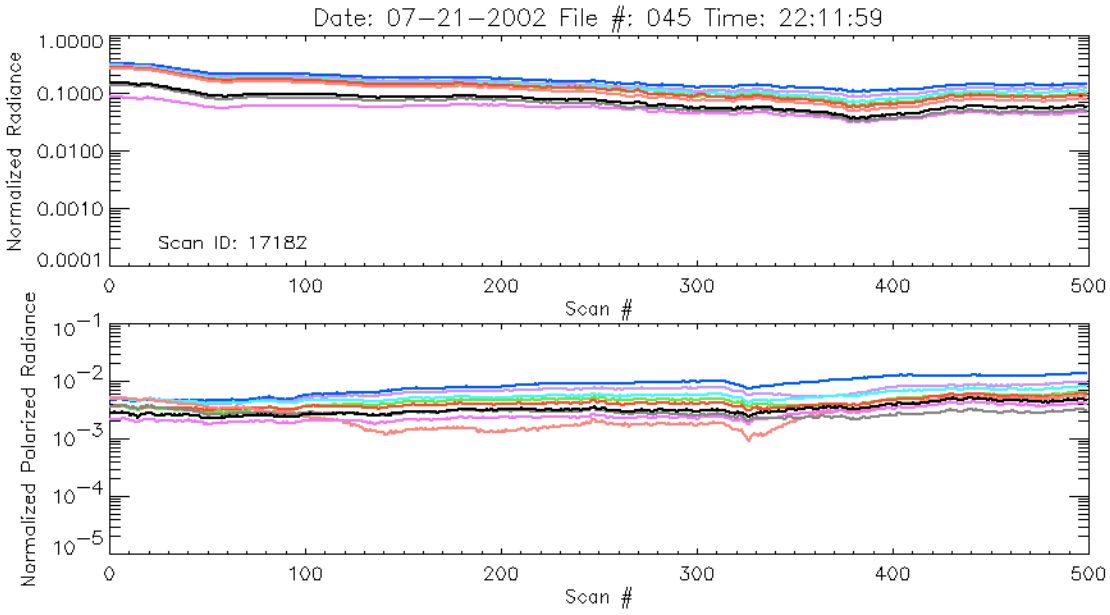

Date: 07-21-2002 File #: 040 Time: 21:42:59
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 15114
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #

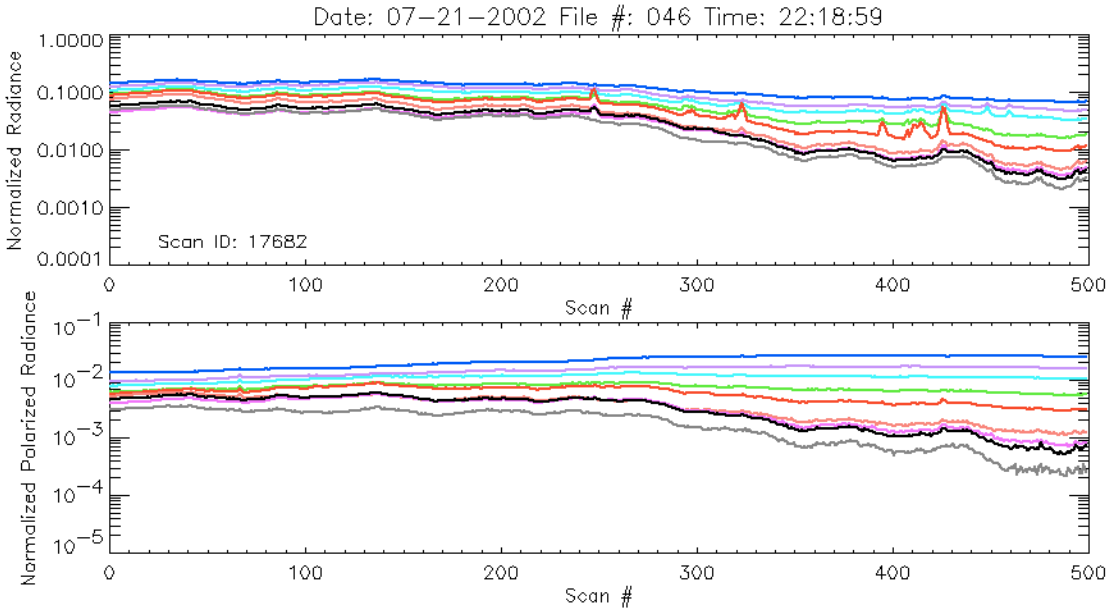

Date: 07-21-2002 File #: 041 Time: 21:50:00
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 15614
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

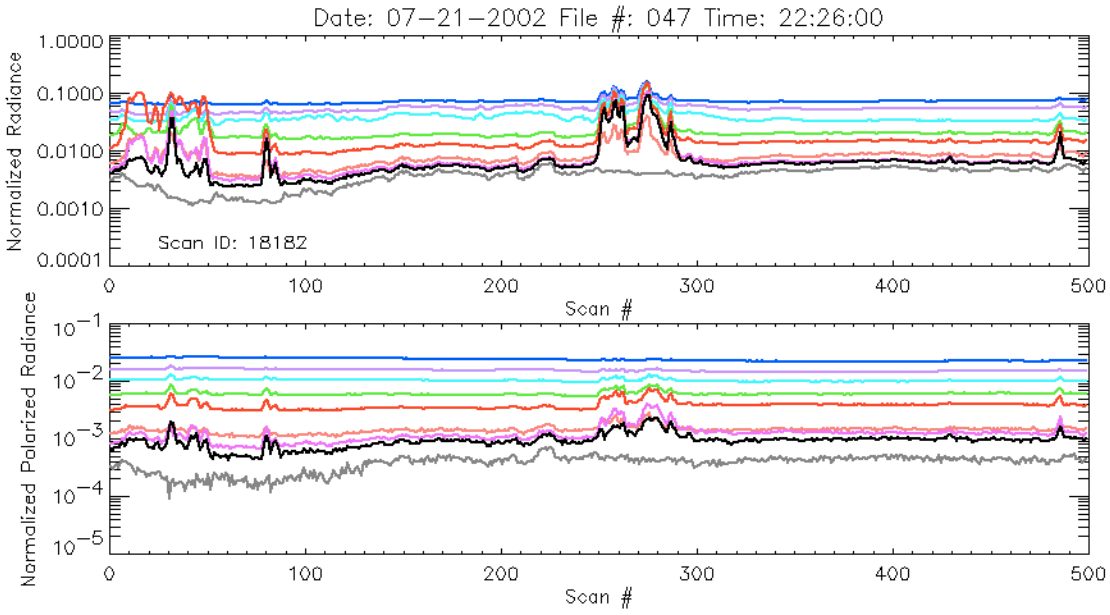

Date: 07-21-2002 File #: 042 Time: 21:57:02
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 16116
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Scan #

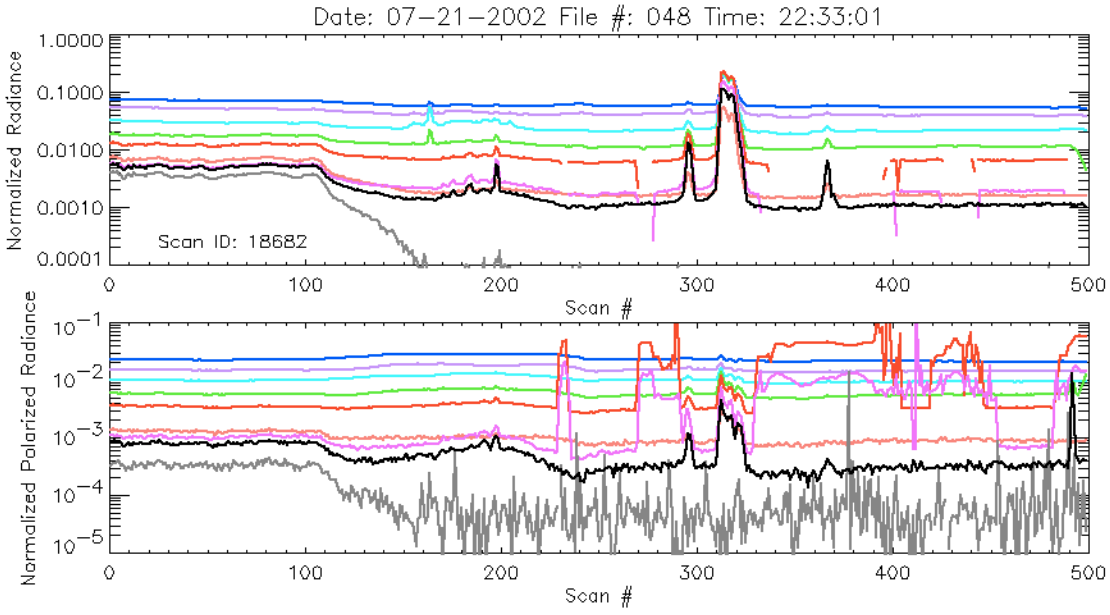

Date: 07–21–2002 File #: 043 Time: 22:04:03
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 16616
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #

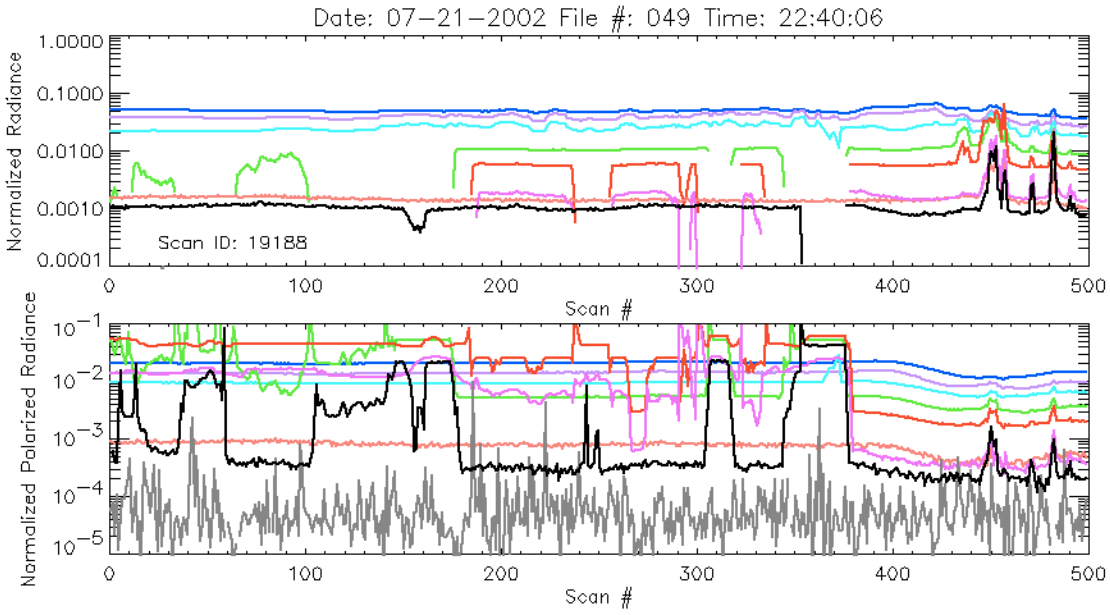

Date: 07–21–2002 File #: 044 Time: 22:04:58
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 16682
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #

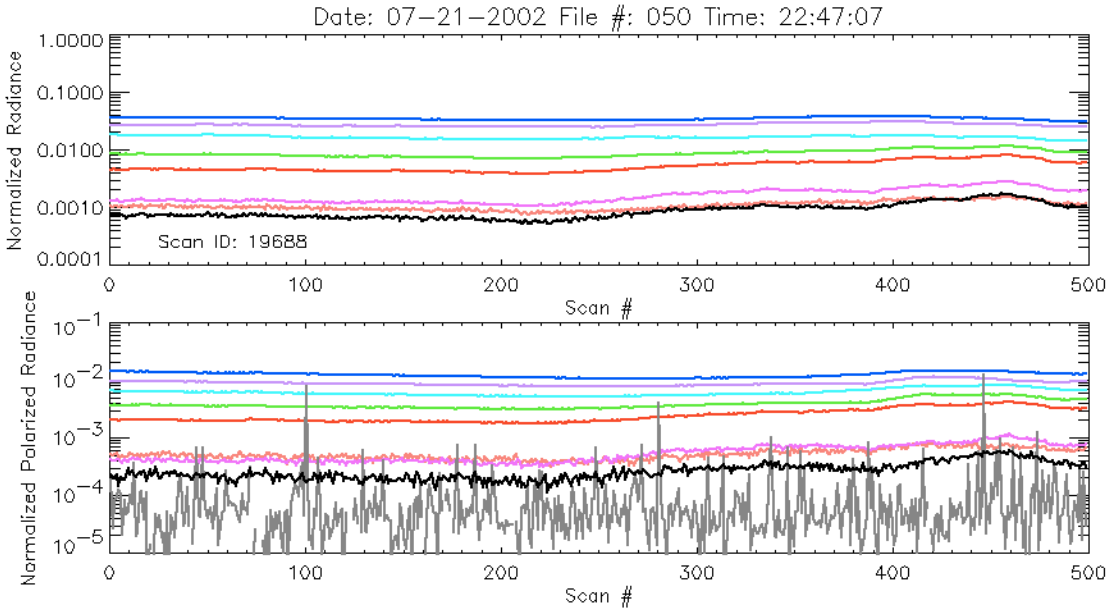

Date: 07-21-2002 File #: 045 Time: 22:11:59
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 17182
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 046 Time: 22:18:59
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 17682
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07–21–2002 File #: 047 Time: 22:26:00
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 18182
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07–21–2002 File #: 048 Time: 22:33:01
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 18682
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 049 Time: 22:40:06
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 19188
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #


Date: 07-21-2002 File #: 050 Time: 22:47:07
Normalized Radiance
1.0000
0.1000
0.0100
0.0010
0.0001
Scan ID: 19688
0
100
200
300
400
500
Scan #
Normalized Polarized Radiance
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0
100
200
300
400
500
Scan #